

THE POLAR TIMES

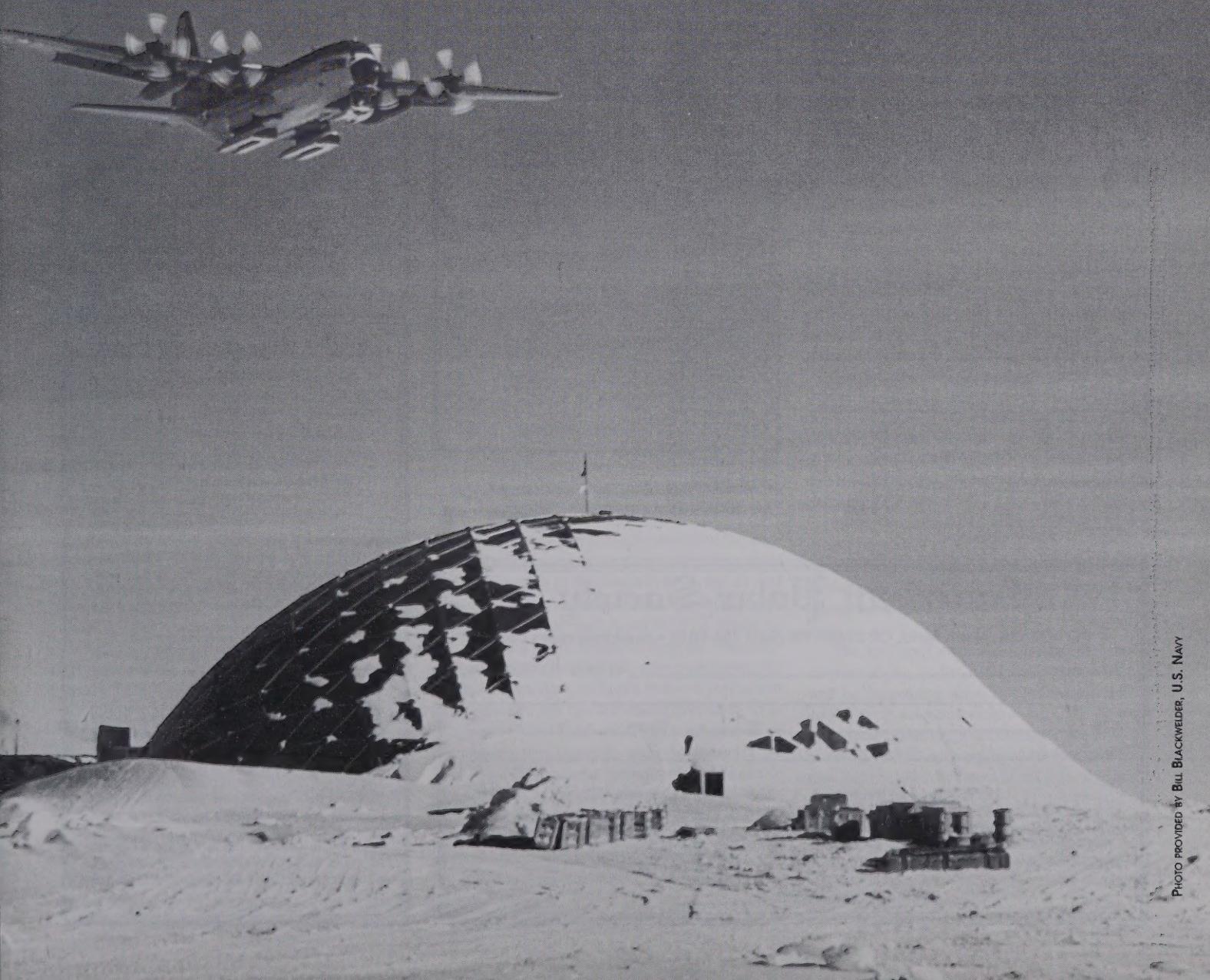


PHOTO PROVIDED BY BILL BLACKWELLER, U.S. NAVY

Secretary's Letter

This issue of The Polar Times does not do justice to those of you who have diligently clipped articles and who have scoured the internet for stories and emailed them to us. We have published about a quarter of the articles that we have received and many of them have been submitted by several people. Our cadre of regular clippers has grown and we are indebted to you. On the other hand it is nice to be able to choose from such a large selection.

We are gratified to note that 35 of our members have opted to become "Life Members" for \$150 (\$170 foreign). This option remains open through the end of the year. However, at the stroke of midnight 31 December 1999 the price jumps to \$200 (\$220 foreign). You are forewarned!

Many of you have not noted the change of address and your mail is being forwarded to me. After September 1st the forwarding service by the USPO will expire so please note the new address listed on our Masthead.

Next symposium looks like it will be at the University of Colorado in October 2000. Details are forthcoming in the next issue.

Sincerely

Brian Shoemaker

Editor's Letter

Please accept my abject apology for our layout in the last *Polar Times*. We are changing printers and would welcome your comments.

Della

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OUR COVER: Navy Terminates Air Operations in Antarctica



The Polar Times

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DELLA WESTON, Editor

The American Polar Society was founded Nov. 29, 1934, to band together all persons interested in polar exploration. Membership dues are \$15 a year (\$17, foreign), and entitle members to receive *The Polar Times* twice a year. The American Polar Society is classified as a tax exempt organization under Sec 501(C)3 of the IRS Code.

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About Your Annual Dues

The Board of Governors has examined the dues structure of the Society and has changed the dues for 1999 as follows:

Annual Dues Rate \$15.00; Foreign \$17.00
Library Dues Rate \$20.00; Foreign \$22.00
Annual Corporate Rate \$100.00
Life Membership \$150.00; Foreign \$170.00

The Board also voted to increase the dues by another \$5.00 and Life membership to \$200.00 in the year 2000.

For ease of administration we ask for annual dues to be submitted at the end of each calendar year, and we include a remittance envelope with the Fall/Winter issue of *The Polar Times*.

Since many of you send in your dues several years in advance, we tag your contributions to our membership files in our computer. This tag prints out on your membership sticker that we place on the envelope for *The Polar Times*. If it reads "expires 1298," then your membership contribution was due on January 1, 1999. If it reads "expires 1297," you are two years in arrears! If in doubt, send in your contributions, and we will credit your account by advancing your expiration date. We will honor all dues paid in advance at the old rate, but upon expiration the new rates apply.

Multiple year contributions are welcome as are donations. We are a tax exempt organization as defined by Sec 501(C)3 of the IRS Code.

The Polar Times

American Polar Society • Spring-Summer 1999

Cover Story

Navy Terminates Air Operations in Antarctica; End of an Era

By Brian Shoemaker

Our cover photo of a Navy C-130 over flying the South Pole Dome is significant at this point in time. The Navy is gone, and the Dome which was flown in pieces by the Navy to the South Pole is due to be dismantled and removed from the Antarctic Continent, signaling the end of an era.

The Navy flew its last flight in Antarctica on February 17, 1999 and decommissioned VX-6, the antarctic support squadron, on 31 March ending an era of Naval Aviation that was begun with Admiral Byrd in 1929 at Little America.

At the decommissioning ceremony there were lots of speeches about numbers of passengers carried, tons of cargo hauled, the number of flights flown—typical Navy language for quantifying routine achievement and to compare the squadron to others with mid-latitude missions.

However, it overlooked the most dynamic aspect of squadron accomplishment—the twin roles that it played in the *geographic and scientific exploration* of Antarctica.

The roots of this dual mission go back to early 1929 when CDR Byrd and his flight crews discovered new lands to the east of Little America from aircraft; Byrd called this “Discovery by Air”. This was followed with the first placement of a scientific party in the field by aircraft when Bernt Balchen and Harold June landed in the recently discovered Rockefeller Mountains with Dr. Larry Gould—the first establishment of a scientific encampment by air and a harbinger of the modus operandi of scientific air operations of the future.

The development of these twin roles continued throughout the 1930's on two more expeditions (BAE II in 1933 and the U.S. National Expedition of 1939). After WWII, Operation High Jump, a massive Navy flying operation was launched that discovered and photographed much of the continental coastline by air as well as a large area of the interior, however, very little scientific field work was accomplished.

Looking at a map of Antarctica on the advent of the buildup of bases for the International Geophysical Year in 1955 one notes that about 70 percent of the continent remained undiscovered—an area larger than the United States. That was the year when VX-6 was commissioned together with other support commands as part of the Naval Support Force Antarctica-Operation Deep freeze. Eleven other nations set up bases in Antarctica, but none has a significant flying operation.

In early 1956 the first long range flights of

VX-6 aircraft were launched. Navy C-54 Skymasters and P2V Neptunes were the first ever to fly to Antarctica from outside the continent a harbinger of a time when almost everyone in the U.S. Antarctic Program would fly in. The Navy C-54 Skymaster aircraft were flown by several routes into the interior of the continent; one from McMurdo to the Weddell Sea and return via the South Pole. Admiral Byrd was flown back over the South Pole and the Pole of Inaccessibility in relative comfort compared to his 1929 flight. Another flight flew to Vincennes Bay and return to McMurdo. Large areas of Antarctica were, in the words of Admiral Byrd “Discovered by Air.”

The R4D Skytrain and the Single Otter Aircraft on skis began to insert scientific field parties into remote areas and support scientific

litation was introduced and began long range mapping operations. In 1959 the ski equipped C-130 Hercules was introduced which enabled the squadron to land relatively heavy loads in the field in support of scientific field exploration. It could also fly across the continent carrying helicopters into the field to expand the squadrons ability to place a scientist anywhere on the continent. The blank spots on the Antarctic map began to rapidly fill in.

In 1963 and 1964 RADM James Reedy and CDR Richard Dickerson made two long flights in VX-6 C-130 aircraft to Antarctica from Cape Town and from Australia respectively, crossing thousands of miles of heretofore unexplored terrain. Afterward they marked off blank spots on the map of the continent and flew out to discover thousands of square miles of relatively featureless polar plateau. Nevertheless they roughly filled out the map.

To tighten the detail of the Antarctic map in 1967 the squadron C-121 Super Constellation aircraft flew gridlines over the continent to radio-echo-sound the thickness of the ice. At a 50 mile grid spacing virtually the entire continent could be seen by VX-6 crews and the scientists who flew with them.

The South Pole Dome was flown to the bottom of the earth by the squadron, assembled and dedicated in 1972 the most prominent building in Antarctica and a symbol of VX-6's ability to establish a U.S. base anywhere in Antarctica and support it year around. No other nation could make that claim.

There was a cost; thirty-two sailors and scientists have died in aircraft crashes—more than have died by falling into crevasses. Support operations by ground crews are also hazardous—twenty have given their lives in the name of science.

The Air Guard which has a distinguished record of polar flying in the Arctic has taken over and will be supporting science from the air and by establishing scientific field camps. We do wish them luck. However, with the departure of VX-6, the era of “Discovery by Air” in the context that Admiral Byrd characterized it is over and a new era has begun. □



Que Sera Sera, first aircraft to land at South Pole at a field camp, 1956

traverses as they scientifically explored the continent up close—on the surface. Gus Shinn made the first landing at the South Pole on the 31st of October 1956 with Admiral George Dufek—the first to stand there since Scott in 1912. Shinn returned many more times hauling the construction workers and scientists who established the United States Base at South Pole—a permanent U.S. presence that has been there ever since. U.S. Air Force C-124 Globemasters parachuted all of the construction materials and machinery for the base. Helicopters were introduced and began to fly scientific personnel into rough terrain areas where fixed wing aircraft could not land. As 1956 drew to a close, an entire continent, still mostly unexplored, laid within the grasp of discovery by VX-6 and the scientists they were dedicated to supporting.

And discover they did. The Super Constel-

Editors note: We have dressed up this article with photographs of the aircraft flown by VX-6/VXE-6 over the years. We realize that to do justice to the squadron we should focus on the men and women who have served. However, there were too many and we don't have the space.

ANTARCTIC DEVELOPMENT SQUADRON SIX; gone, but not forgotten.



UH1N *Huey* at a glacier camp in the Victoria Mountains.



C-121 *Constellation* on deck at McMurdo.
Both the Connie and the huskies are only memories.

R4D
Skytrain
crashes
during
takeoff.
Thirty-two
sailors and
scientists
have died
in flight
accidents,
1955-1999.



R4D *Skytrain* crashes during takeoff.



R5D *Skymaster* being readied for flight during a storm. The Skymaster was the first aircraft to span the continent by air.

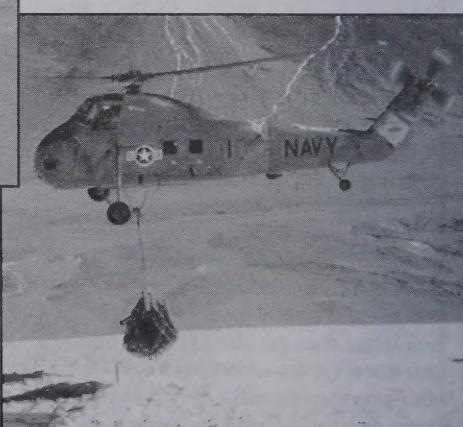


Single-engine *Otter* servicing a traverse party camp during IGY.

P2V *Neptune* on deck at traverse party encampment during IGY. Skymasters and Neptunes were the first aircraft to fly to Antarctica from another continent.



← C-130 *Hercules* on skiway at McMurdo. The C-130 transformed Antarctic logistics.



Sikorsky H-34 carries a slingload into a science camp in the Dry Valleys near McMurdo Sound.

Iceland Decides to End 10-Year Ban on Whaling

Washington Times, 13 March 1999, p. A9, by Jonathan Lynn, STOCKHOLM—Iceland's parliament has voted to end a 10-year ban on whaling and asked the government to prepare for a resumption by next year, a senior official said yesterday.

The parliamentary resolution, passed on Wednesday, is certain to outrage environmentalists but underlines the fiercely independent North Atlantic island's determination to hunt the seas as it sees fit.

"Parliament gave the green light for the resumption of whaling in Iceland," the government official, who asked not to be identified, said by telephone from Reykjavik.

The resolution urges a resumption of whaling as soon as possible, upholds Iceland's sovereign right to harvest its resources, calls on the government to implement the decision, and assumes whaling will start no later than 2000.

Although the booming economy has diversified in recent years, fishing still ac-

counts for 75 to 80 percent of exports.

Whaling is also a traditional way of life and was important commercially, accounting for 2 percent of exports at its peak.

The International Whaling Commission (IWC) decided in 1982 to ban whaling amid concern that many whale species

Whaling is also a traditional Icelandic way of life and was important commercially.

were endangered. Whaling stopped from 1985, although Iceland continued until 1989 to take some whales for scientific purposes.

Iceland went along with the ban because it was thought to be temporary, but left the IWC in 1992.

Whale stocks are now growing and, according to some Icelanders, threatening

the fish stocks on which the island depends. Some species, such as the minke whale, are not threatened with extinction, they contend.

Iceland, with a population of only 275,000, is too small to absorb many whales, so much of the whale meat taken after the ban is lifted would be exported. Until the ban, Iceland was catching an average 236 fin whales, 200 minke whales and 70 sei whales a year, according to official documents.

Iceland feels it is free to trade in whale meat because it is no longer a member of the IWC, and is not a signatory to the Convention in International Trade in Endangered Species (CITES).

Norway resumed whaling in 1993, although it does not allow international trade in whale meat and is campaigning for minke whales to be removed from CITES. □ (cb Peter Barretta)

Russia Confirms It Held 5 Nuclear Tests in Arctic

Washington Times, 25 December 1998, p. A12, MOSCOW—Russia conducted five nuclear tests of a sub-critical level at an Arctic testing range this fall, a top official said yesterday, contradicting previous denials.

The *Washington Times* reported Sept. 24 that a U.S. spy satellite had photographed vehicle activity at Russia's remote Arctic nuclear test site on Novaya Zemlya Island, indicating Russia was preparing to set off an underground blast.

A nuclear test would break Moscow's self-imposed testing moratorium that began in 1990 and would contradict Russia's commitment to the Test Ban Treaty.

Yesterday, Russian Deputy Nuclear Energy Minister Lev Ryabev confirmed that five nuclear tests were conducted on the Arctic archipelago of Novaya Zemlya between Sept. 14 and Dec. 13, the Interfax news agency reported.

Weapons-grade plutonium and enriched uranium were used during the tests, but "there was no discharge of nuclear energy," Mr.

Ryabev was quoted as saying by Interfax.

On Oct. 9, Moscow denied the reports that it was conducting the tests although in fact they had already begun, Mr. Ryabov said.

Gen. Igor Volynkin, who heads a Defense Ministry department overseeing nuclear weapons, said at the time there were no plans for nuclear tests at the Novaya Zemlya range and that Russia only carries out "various physical modeling experiments" that do not qualify as nuclear tests.

A nuclear test would break Moscow's self-imposed testing moratorium that began in 1990 and would contradict Russia's commitment to the Test Ban Treaty. As a treaty signatory since Sept. 24, 1996, Moscow is expected to refrain from any activities that would undermine the treaty, even though it has not been formally ratified or formally gone into effect worldwide.

Mikhail Shurgalin, a Russian Embassy spokesman, said in September that he was unaware of the nuclear testing activity on Novaya Zemlya. But he said Moscow was abiding by its testing moratorium. "The policy is in full compliance with the moratorium," he said.

Clinton administration officials have sought to play down evidence of Russian nuclear testing because of concerns it would complicate efforts to win Senate ratification of the Test Ban Treaty.

Previous Russian testing incidents also have raised fears among members of Congress that U.S. aid to Russia for disarma-

Clinton administration officials have sought to play down evidence of Russian nuclear testing because of concerns it would complicate efforts to win Senate ratification of the Test Ban Treaty.

ment could be helping Moscow build nuclear arms. Moscow recently tested a new intercontinental ballistic missile.

In January 1996, U.S. intelligence agencies recorded what was believed to be a small nuclear test in northern Novaya Zemlya. Then, on Aug. 17, 1997, a suspicious "seismic event" was detected near Novaya Zemlya that led the U.S. government to suspect Moscow set off a nuclear test.

The State Department filed a formal diplomatic note with Moscow seeking an explanation and was told the activity detected was an earthquake. The U.S. rejected the explanation. □ (cb Peter Barretta)

Piracy on the Cold Seas

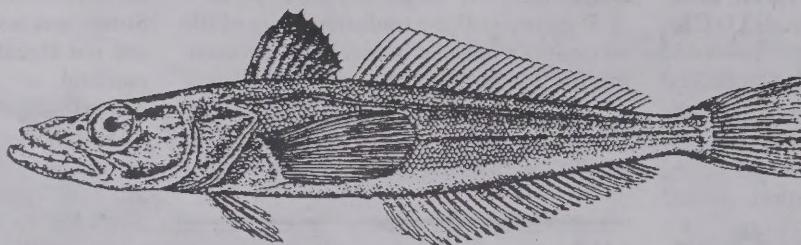
Audubon, May-June 1998, p. 22, by Jeff Rubin—

With fish stocks over-exploited nearly everywhere, fishermen are heading to the Southern Ocean, the world's most dangerous sea, which girdles Antarctica. There they battle enormous waves, furious gales and bitter cold to set out longlines for the Patagonian toothfish. France, Australia, and several other countries own islands in the region, and they license boats to fish offshore. More than 20 boats are licensed, but more than 100 boats are fishing illegally. Two dozen countries are involved in the poaching; the chief culprits are Norway, Denmark, Spain, Argentina and Chile, which together account for as much as two-thirds of the illegal fishing. Mauritius is the chief port of call for the poachers; there they off-load quick-frozen toothfish for sale in Asia.

An extremely slow-growing species, the Patagonian toothfish can live more than 50 years and reach six feet in length—though most of the fish now being caught are little more than two feet long. Its delicate white flesh is espe-

cially prized in Japan, where it is called *mero*, and in the United States and Europe, where it is known as Chilean sea bass. Toothfish once brought prices as high as \$7,000 a ton, but with poachers having taken 100,000 tons in 1997—10 times the legal limit—prices have fallen to less than half the levels of just three years ago. Nevertheless, the annual catch is worth more than \$250 million. Authorities believe that a substantial volume of toothfish is stored in commercial freezers around the world, and that suppliers are waiting for prices to rise when the fishery begins to be depleted.

France has just enacted new fisheries regulations, which provide for fines as high as \$172,000 for each ton of illegally caught toothfish



on board boats within its waters. France and Australia have seized a total of eight boats this season. In response to the new regulations, the poachers have begun off-loading their catch to mother ships, which remain just outside territorial waters.

Fishing in the area, legal and illegal, has had one particularly nasty side effect.

Seabirds, especially albatrosses, are drowned when they ingest the baited hooks on the longlines. Since a single boat can set longlines bearing as many as 50,000 hooks every day, biologists estimate that well over 100,000 birds—among them several threatened species—are killed annually. Alistair Graham, spokesman for an Australia-based environmental group that tracks illegal fishing in the Southern Ocean, says scientists estimate that if the present levels of poaching persist, both the albatrosses and the toothfish will be seriously imperiled within four or five years. □

Editors Note: Jeff Rubin is a member of the Board of Governors of the American Polar Society.

Fish Patrol Guards Frigid Frontier

The Associated Press, 1 May 1999, by Todd Lewan **on patrol in the BERING SEA**—Nothing marks the boundary that runs down the middle of this vast, frigid waterworld. Yet dozens of fishing boats cluster it. Coast Guard cutters prowl it. Surveillance jets and helicopters swoop over it. And, sometimes, shots are fired when poachers pay no attention to it.

The Russian-U.S. maritime line slices across the Bering Sea, the richest fishing grounds left in an overfished world and the latest front in the global free-for-all for control of humanity's watery commons. Out here, the line means everything to everyone except the prize: the pollock swimming 60 stories below the surface. In the darkness of the deep, they glide in silvery clouds, millions upon millions of them.

On the Russian side, dozens of trawlers from Japan, China, South Korea, Thailand, Taiwan, Poland and Norway work unchecked, having paid the cash-starved Russian government for fishing permits. These floating factories hum 24 hours a day, scooping up catches so large that managers measure them in hundreds of tons, with nets so enormous that each could hold a dozen jumbo jets. With each passing year, the catch dwindles, and the vessels creep closer and closer to the line in the sea.

On the American side, the U.S. Coast Guard watches and waits. Day and night, helicopters, C-130 planes and four cutters patrol a line as long as the road from Boston to Miami. Mission: To keep out hit-and-run trawlers that have already depleted the waters on the Russian side.

During a surveillance flight last May off the southwestern tip of the Aleutian Islands, a C-130 crew spotted trouble: Five foreign trawlers on the wrong side of the maritime line were catching salmon with 10-mile-long drift nets—a violation of a U.N. ban on drift-net fishing. While three Coast Guard cutters steamed to the scene, the trawlers cut their nets loose and scattered. One of the poachers got away. But the cutter *Boutwell* intercepted a Russian trawler, handed over custody to Russian authorities, then stopped a Chinese ship after a 1,200-mile, four-day chase through a typhoon. The cutter *Jarvis* caught up to the fourth poacher, a Chinese ship, near Japan a week later.

Meanwhile, the cutter *Polar Sea* was tracking the last trawler deep into Russian territory. For three days the Chinese vessel zigzagged in heavy fog and rain. Then a Russian patrol boat appeared. Moments later, as the *Polar Sea* turned to head back to Alaska, the Russian boat opened fire on the fishing vessel. The trawler's skipper and a navigator were killed. Three other fishermen were wounded.

The Bering Sea is a complex, largely hidden web of life. Inhabited by whales the size of ships and diatoms as small as a single cell, the sea pulses with at least 525 species of fish, shellfish, marine mammals and sea birds. This 800,000-square-mile wilderness supports the world's most extensive eelgrass bed, the world's largest salmon grounds. It produces more than half of the nation's seafood.

And it is showing signs of stress. The Bering Sea's fur seal population is declining. Several species of crab and sea birds, including the red-legged kittiwakes, are dwindling. The Steller sea lion, the mammal at the top of the Bering Sea's life chain, is endangered. Pollock, the sea's most abundant fish, has shrunk to half its 1985 population. And trawler nets that sweep ocean floors in pursuit of bottomfish like pollock often act like wrecking balls, disrupting plankton, plants and a myriad of microorganisms that whales need to survive. Climatic shifts or sudden changes in currents may play a role, but a growing number of scientists say the Bering Sea is overfished.

In February, the North Pacific Fishery Management Council, a federal body largely comprised of industry representatives, issued an emergency order banning pollock fishing around the Aleutian Islands, where the fish spawn. It also reduced, at least temporarily, the catch limit by more than 10 percent—which will cost the Alaskan fishing industry \$50 million in 1999.

Of course, quotas and controls drawn up in conference halls in Anchorage don't mean much 1,000 miles west, where roughly 70 trawlers are roaming the Russian side of that invisible boundary, waiting for the Coast Guard's resolve to crack. □ (cb Billy-Ace Baker)

Editor's Note: AP National Writer Todd Lewan sailed with the U.S. Coast Guard cutters *Storis* and *Sherman* and flew with the crew of a Coast Guard C-130 aircraft to report this story.

Antarctic Plankton Get Boost

The Associated Press, 16 January 1999, WELLINGTON, New Zealand — Researchers have dumped iron filings into a large area of ocean near Antarctica, hoping to boost plankton growth and eventually cut down on greenhouse gases.

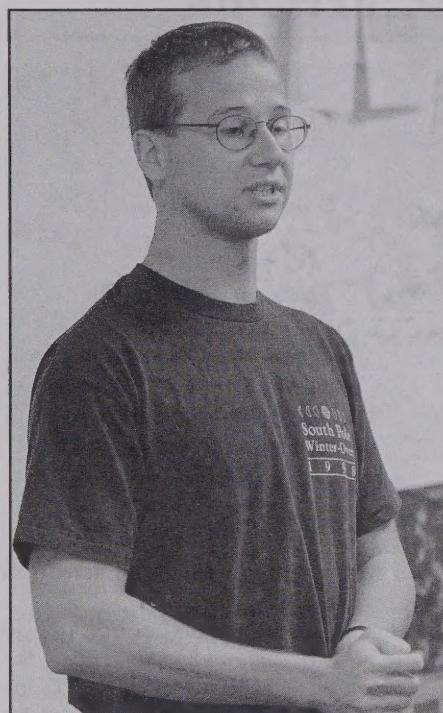
A research team returned to Wellington on Monday from its 30-day scientific expedition into Antarctic waters 2,500 miles southwest of New Zealand. The researchers want to replenish phytoplankton, the primary food source in the food chain for global fish stocks. The scientists say the phytoplankton will capture excess carbon dioxide, thus slowing its accumulation in the atmosphere. Many scientists blame carbon dioxide and other greenhouse gases for contributing to global warming. National Institute of Water and Atmospheric Research regional manager Rob Murdoch said the studies had been extremely successful and "scientists are excited by the preliminary results."

A California oceanographer, the late John Martin of Moss Landing Marine Laboratory, theorized in 1995 that the ocean's microscopic plants, phytoplankton, needed iron in order to take nitrogen and phosphate from seawater, just as farm crops need trace minerals such as zinc and manganese. Scientists don't yet know whether the iron fertilizing would have harmful side effects, or unintended consequences over the long term. Previous tests of the theory by dumping half a ton of iron filings into the Pacific Ocean off the Galapagos Islands triggered a 30-fold to 40-fold increase in phytoplankton over a 116-square-mile area. □ (cb Billy Ace Baker)

Delayed Migration

Fairfax (VA) Journal, 18 December 1998, p. A2 — The end of the record warmth that covered parts of the Canadian Arctic for much of the last two months has finally allowed the famed Hudson Bay polar bears to migrate northward to their winter habitats. The lack of pack ice over the expansive body of water had left the animals stranded for over a month near Churchill, at the south end of the bay. The polar bear population of Hudson Bay averages about 1,200, and the animals move north each year to hunt and live on the arctic ice shelf during the winter months. In summer, they roam around the town of Churchill, which has turned the bears into a growing tourist attraction. □ (cb Peter Barretta)

Antarctica Comes to Brooklyn



Antarctic scientist Robert Schwarz

Antarctic stint to return to his life as a university student in Germany, what he did in his spare time in the land of ice.

He responded that he sent emails, watched videos and read newspapers on the Internet.

"Did you ever feel like you just wanted to go home?"

"Nope."

"Do they have electricity down there?"

"Yes, the station is very modern."

"Did you have Nintendo 64 down there?"

"Nope. You can bring it if you want."

"Has anybody ever stuck their tongue on the South Pole?"



Kelly Klitzman asks a question about life at the South Pole

"I wouldn't recommend it."

In addition to answering a plethora of questions, Schwarz showed slides and displayed the hundreds of photos of the station that fill his World Wide Web page. Included were breathtaking shots of auroras, brilliant streams of light in the night sky.

In addition to Brooklyn, Schwarz has been communicating via email with students in Germany, Australia and at other sites around the United States. This was the first group he had met in person.

Schwarz was a graduate student at a university in his hometown of Munich. He interrupted his studies two years ago when the opportunity appeared to travel to the South Pole through the University of Wisconsin's high-energy physics department.

Sinks said Schwarz's visit was a rare treat. "The kids don't get to see a real living scientist very often," he said. To see Schwarz's photos and learn more about the project, go to www.amanda.berkeley.edu on the Web. □ (cb John Ong)

They asked Schwarz, who has ended his

Plane Freed After 49-Day Ordeal



PHOTO BY BOB BULLOCK/NY ANG

Daily Gazette, 5 January 1999, by Lynn Brezosky, GLENVILLE—A C-130 aircraft that dropped a ski through the ice in a remote area of western Antarctic has returned to relative civilization on its own wings, after an arduous, 49-day recovery operation.

The \$45 million plane's left ski sank into an ice crevasse on Nov. 16, seconds after glaciologists from the California Institute of Technology had gotten off to establish a research camp.

On Monday in Antarctica, the plane was flown back to McMurdo Station, the main United States base.

Doing so involved the combined forces of the U.S. Air Force and American and New Zealand civilian technicians.

On Nov. 15, a crew from the 109th Tactical Airlift Wing dropped off four California Institute of Technology researchers to Upstream D. The scientists planned to take core samples and conduct other experiments to help in the understanding of glacial movement.

Upstream D is located on Antarctica's western ice shelf, a region known for ice floes—rivers of ice moving within the ice.

It is virtually unexplored and riddled with hidden cracks and gaps that are undetectable above the snow.

Despite the use of satellite imagery and consultation with professional mountaineers who are familiar with the crevasses, the plane landed near just such a hazard.

As the plane taxied toward takeoff, its left ski broke through a snow bridge, causing the aircraft to drop onto its left wing tip and fuel pod.

There were no injuries in the accident,

and a rescue crew transported scientists and crew to safety.

A camp was set up, and as many as 30 people at any time worked to replace the aircraft's engine and two propellers. Efforts to recover the plane were hampered by weather and fear of more crevasses.

Engineers from the Cold Regions Research Engineering Laboratories (CRREL) in Hanover, N.H., used ground-penetrating radar to locate other crevasses. Field safety experts from Antarctic Support Associates of Denver surveyed the area for a safe place to operate. Heavy equipment operators worked for days to fill a 140-foot-deep ice fissure.

And then 109th maintenance personnel, the Combat Logistics Support Squadron from Robbins Air Force Base in Georgia, and Air New Zealand used plywood, snow and 12-by-12 foot airbags to stabilize the area under the left main ski while digging snow out from under the right ski.

Once leveled, the plane was harnessed to a tractor and pulled to the repair area.

"We're absolutely delighted with the cooperation that went into the recovery of the aircraft, from both civilian and military sources," Major Bob Bullock of the 109th Wing said in a telephone interview from Christchurch, New Zealand.

The plane was flown to New Zealand, where final repairs were made by Air New Zealand.

One good thing came of the recovery effort. Thanks to all the radar and mapping conducted to make sure repair crews had a safe place to work, the four scientists can now be assured their camp is on solid ice. □ (*Multiple contributions*)

South Polar Skua Drawing a Crowd in Florida

Associated Press, 13 December 1999, OCEAN RIDGE, Fla.—Snowbirds of the two-legged variety have some winged company in Florida these days. A south polar skua has spent the last five weeks hunting, and drawing crowds at a beach known for surfing.

Bird watchers by the hundreds have flocked to this stretch of beach, just south of Boynton Inlet Park on Florida's east coast to see the bird. It is the first confirmed sighting of the large predatory species in southern Florida.

Environmentalist Kim Jones first reported seeing the bird on Nov. 11.

She believes the bird may have been blown off course by Hurricane Mitch—a likely scenario, according to birders from the Florida Audubon Society.

Birders also have spotted skuas in the Jacksonville area and off the coast of Georgia □ (*cb Billy-Ace Baker & Peter Barretta*)

Christchurch Role in Trips to Ice Pushed

Christchurch Press, 24 December 1997, by Mike Crean—Christchurch could reap economic benefits by becoming the gateway for Antarctic tourism, says Mayor Garry Moore.

The scope for science tours to the Antarctic is immense, said Mr Moore, who visited the Ice last month courtesy of Antarctic New Zealand. He wants a trust established to operate tours from next summer and pour profits back into Antarctic research.

Thousands of tourists were travelling to Antarctica from South America, proving a huge demand existed.

Mr Moore has discussed with commercial leaders his ideas for developing an Antarctic tourism trust to operate a science-tourism industry based in Christchurch. He said profits should supplement inadequate Government funding for Antarctic New Zealand research. Much important research needed to be done and science tourism was an appropriate source of funds.

It should offer a high-quality, high-price experience, which could involve Canterbury University in activities for visitors before they left Christchurch.

"Christchurch must look at how it can capitalize on its status as gateway to Antarctica." In addition, New Zealand's Scott Base offered a more intense Antarctic experience than the South American base as it was much closer to the South Pole.

Visitors to the Ice quickly adopted strong conservationist beliefs, which should alleviate concerns for the environment. □ (*cb Billy-Ace Baker*)

"We're absolutely delighted with the cooperation. . . ."

Antarctic Passports

by Brian Shoemaker

(第1面)

南極地域活動行為者証
Certificate for Antarctic Activities

第140号／No.140

平成11年2月9日／9 FEB 1999

有効期間 平成11年2月18日から
平成11年2月26日まで
Valid 18 FEB 1999 through
26 FEB 1999

環境庁長官

Director General of the Environmental Agency
Government of Japan

確認を受けた年月日 Date of certification	平成11年2月9日 9 FEB 1999
氏名 Name	大瀬 正美 OSE MASAMI

確認された南極地域活動に係る事項
Issues related to the Antarctic Activities

目的 Purpose	観光 Antarctic Tour
時期 Timing	平成11年2月18日から2月26日まで 18 FEB 1999 ~ 26 FEB 1999

As part of the implementing legislation for the Protocol on Environmental Protection to the Antarctic Treaty, the Government of Japan decreed that all of their nationals who visit Antarctica must obtain a "Certificate for Antarctic Activities"—essentially a national passport to Antarctica.

Every Japanese national who intends to travel to Antarctica, whether scientist, tourist, explorer or worker must apply for a "Certificate for Antarctic Activities" to the Director General of the Environmental Agency, Government of Japan.

As part of the certification process applicants are briefed on the do's and don'ts of the Antarctic Treaty, the Protocol on Environmental Protection of the Antarctic Treaty and the Agreed Measures for the Conservation of Antarctic Flora and Fauna. The certificate is then issued listing the purpose of the visit, when they may go, where they may travel and the means by which they may travel. The certificate also lists the regulations by which the visitor must abide.

All tourist companies that carry visitors to Antarctica conduct mandatory briefings for their passengers while sailing south to Antarctic waters. For most it is their first exposure to regulations governing their conduct while there. Japanese tourists were a standout exception—all who visited Antarctica in the summer of 1998-99 not only carried their "Certificates for Antarctic Activities" (See Diagram), but were much better informed than visitors of other nationalities. More important they were model visitors to the Antarctic. □



PHOTO ASSOCIATED PRESS

Camera-equipped Weddell seal with codfish

Washington Times, 12 February 1999, p. A8—

A camera the size of a tennis ball and a tiny computer are helping scientists understand how Antarctic seals behave when they disappear deep below the ocean's frozen surface, researchers said yesterday.

The marine mammals employ a variety of clever techniques to capture their food, including blowing bubbles to flush out fish from crevices in the ice, Randall Davis, a Texas A&M University marine biologist reported in the journal *Science*.

Among his findings: Seals have sharper eyesight than anyone believed, letting them hunt by sight instead of using sound, as previously thought. If a fish tries to hide in a tiny crevice in the ice, a seal literally blows it out into the water to give chase. And the seals can navigate

back to a small air hole in the ice even after traveling more than a mile underwater.

Because marine mammals spend large amounts of time underwater, they are far more difficult to observe in their natural environment than land animals.

But the study of a species called the Weddell seal, which spends up to 90 percent of its time underwater, offers a first glimpse of how marine mammals hunt.

"Now we have technology that allows us to travel with these animals vicariously," Mr. Davis said. "This technology has opened up a window to finally observe them in their natural environment."

Weddell seals, which can grow up to nine feet long and weigh 1,000 pounds, are docile creatures with no natural land predators. Researchers said they caught some of the seals and attached small cameras to their heads and a tiny computer system to their backs.

As the seals sliced through the icy waters at depths of up to 2,000 feet below the frozen surface of Antarctica's McMurdo Sound, the computer collected data every second to enable the team to recreate the mammals' movements.

The tapes showed that the seals use a combination of stealth and ingenuity when hunting for food. In stalking large fish such as cod, the mammals maneuver beneath their prey and then strike in a sudden attack.

But when hunting small prey, they blow air bubbles into ice crevices to draw out fish that have taken refuge in these pockets, Mr. Davis said. □ (cb Nathan Frank & Peter Barretta)

Ski Trekkers Reach South Pole, Given Warm American Welcome

Wis. State Journal, 27 January 1999, by Sally Arthy, SCOTT BASE, Antarctica—Hauling 395-pound sleds, Peter Hillary, son of Mount Everest conqueror Sir Edmund Hillary, reached the south Pole with two other ski trekkers Tuesday after an Antarctic journey beset by problems.

Hillary and his father, who was also part of a trans-Antarctica expedition in the 1950s, are the first father and son to reach the bottom of the world.

"Now that I've got here, everything seems worth it," he said after his team reached the United States' Amundsen-Scott base. "I wouldn't want to be anywhere else."

The New Zealander and his two Australian companions had hoped to ski trek from the Antarctic coast to the South Pole and return without airdrops or any other outside support.

But that goal was abandoned two weeks ago, after howling winds, blinding blizzards, unbelievable cold, illness and frostbite delayed their journey so the trio had to receive food from a helicopter from the U.S. base.

In a telephone interview with TVNZ, a New Zealand television station, Hillary said: "The

American people at the South Pole have been most hospitable. A hundred of them came out and cheered. They've given us a wonderful meal."

Besides conquering the South Pole, Peter Hillary also has duplicated his father's famous 1953 ascent of Mount Everest, the world's highest mountain.

"Congratulations, Peter, on this marvelous achievement of reaching the Pole," Sir Edmund Hillary told his son in a message.

Britain's Queen Elizabeth II also praised the trio "on your notable achievement," in a message read to them on their Iridium mobile phone as they stood at the pole.

Hillary said it was "a marvelous feeling" to have skied trekked more than 875 miles from the Antarctic coast to the pole through all sorts of obstacles.

The same problems that eventually killed British explorer Robert F. Scott and his companions during their 1911-12 bid to march to the South Pole and back thwarted this attempt by Hillary and teammates Eric Philips and Jon Muir. □ (cb John Ong)

Did Earth Tilt More Toward Sun Eons Ago?

Washington Times, 3 December 1998, p. A6—The Earth might have tilted far more toward the sun 600 million years ago than it does today, making the polar regions warm and the tropics cold, researchers say.

This theory of planetary tilt has been around for a while, but researchers at Pennsylvania State University have come up with an explanation of how the Earth could have moved from an angle as great as 55 degrees to its current position, a more modest 23.5 degrees.

The buildup and melting of glaciers during this period might have created enough force to cause the planet to straighten up on its axis, the researchers theorize in today's issue of the journal *Nature*.

"Like when you repeatedly push on a swing at the same point in the swing cycle," said co-author James F. Kasting. "If you give it a little push at the right time, the swing goes higher and higher."

The seasons as we know them occur because of the tilt of the Earth as it travels around the sun. When the North Pole is tilted on its axis toward the sun, summer occurs in the Northern Hemisphere and winter in the Southern Hemisphere.

If the Earth's axis had been tilted more in

the past, day and night over much more of the globe would have been like the days and nights now experienced only in Alaska and other polar regions—extremely long days during the summer and extremely long nights during winter

In addition, the poles would have received most of the sun's warmth, and the equator would not have been the warmest place on Earth, as it is now. That would have kept the poles ice-free and allowed glaciers to form around the equator.

Still, even the paper's authors concede their work is clouded by uncertainties. Mr. Kasting, who wrote the paper with Darren M. Williams and Lawrence A. Frakes, said, "I'm sort of sitting on the fence as to which mechanism is right."

Harvard researcher Paul Hoffman, who recently reported on evidence indicating glaciers killed off almost all life during the same time period, said Mr. Kasting's explanation is possible, but he supports the "snowball Earth" scenario to explain the existence of glaciers in the tropics.

Under the scenario, glaciers crept toward the equator from the poles and eventually melted.

Richard Peltier, a professor of physics at

the University of Toronto, said the mechanism proposed by the Penn State researchers was not explained in enough detail.

But he is "not so skeptical to say it's totally unreasonable. It's an interesting idea that needs to be more fully explored." □ (cb Peter Barretta)

Barrow Whalers Take Four on Opening Day

Alaska, February 1999, p. 15 barrow, Alaska—The Little Kupaaq crew took the first bowhead of Barrow's fall whaling season early on opening day in September. The kill was quickly followed by three more and by the end of the day, four whales were on the beach being butchered, much to the delight of Barrow villagers.

The first batch of *uunaalik*—fresh boiled skin, blubber and whale meat traditionally given to the butchers—never made it to the Little Kupaaq crew. A crowd of eager villagers snatched up the delicacy before it could be delivered.

"We've been waiting for this all summer," Kelly Long told the *Arctic Sounder* as she shared pieces with Esther Rexford and Margaret Solomon.

Little Kupaaq's 42-foot bowhead whale was quickly followed by a 30-foot whale taken by the P.K. crew led by Simeon Kunaknana, a 37-foot whale taken by the Tuutak crew led by William Leavitt, and a 35-foot whale taken by a crew led by George Ahmaogak. □ (cb Peter Barretta)

Treaty Ministers Visit Ice

Antarctic Sun, 31 January 1999, p. 3, by Alexander Colhoun—The meeting was a long time coming.

Forty years after signing the Antarctic Treaty, ministers of 24 nations gathered in Antarctica to discuss the political management of growing environmental concerns facing this distant, ice-covered continent.

"The meeting is designed to be a fact-finding and informal one," said Simon Upton, New Zealand's minister responsible for Antarctica. "It will achieve its primary goal if it focuses significant political attention on the continent and its dependent eco systems."

Ambassadors and ministers traveled from the far corners of the globe, including India, Peru and Bulgaria, to experience the Antarctic environment and its logistical challenges first hand.

The meetings, held at McMurdo's Albert P. Crary Science and Engineering Center, focused on environmental issues ranging from the illegal exploitation of toothfish stocks (See "Piracy" article pg. 6) in Antarctic waters to the growing influx of tourists, some 12,000 strong each year, across the continent.

"Antarctica's main defense has been its isolation. It has been 'out of sight, out of mind,'" said Upton. "But technological changes are rapidly diminishing that isolation. The recent expansion of illegal toothfishing has shown just

how vulnerable this pristine environment is."

But the most important lessons came from the hands-on experience of traveling to and around the continent. The two-day meeting was highlighted by visits to the Dry Valleys, penguin rookeries and Scott's Hut—the wooden structure used by Scott during his 1911-12 expedition to the South Pole.

"It's beautiful here, beyond my dreams," said Katia Todorova, deputy director of Bulgaria's international law department, as she looked out over the Ross Ice Shelf. "My first impression is that society is quite established here."

"It's quite impressive," said Takayuki Kimura, Japan's ambassador of international trade and global environment. "They are doing lots of research and must have a very tough time working here, but they have a good life as well—if I were young, I'd have volunteered for a month or so."

Walking across the ice, watching penguins slip into the sea and riding helicopters above the Dry Valleys gave diplomats a fresh new perspective for their work and set the tone for the next meeting in Peru. "This meeting creates the right atmosphere for the upcoming meeting in Lima," said Edwardo Airaldi, Argentina's undersecretary of foreign policy. "Here we can talk informally about the issues." □ (cb Billy-Ace Baker)

Icy Eruption

Fairfax (VA) Journal, 24 December 1998, p. A2—A volcanic eruption beneath Iceland's Vatnajoekull glacier spewed a pillar of steam and ash 20,000 feet into the air. Vatnajoekull is Europe's largest glacier and is located about 125 miles south of the capital Reykjavik. Scientists say increased activity could continue during the next several days, but local residents are not in any immediate danger. The eruptions are unlikely to cause heavy melting of ice and threaten flooding in the area. In 1996, an eruption melted ice and caused a nearby lake to overflow, flooding Iceland's south coast, sweeping away roads and bridges. □ (cb Peter Barretta)

In New Land of Eskimos, a New Chief Offers Hope

New York Times, 4 April 1999, p. 4, by Anthony DePalma, IQALUIT, Nunavut—Part of Paul Okalik's story strikes a sad and familiar note here in the north.

Like many young Eskimos, he had no real sense of hope about his future when he was growing up in Pangnirtung, the next community north of here. After his older brother Norman killed himself rather than be sent back to jail, he started drinking and eventually became an alcoholic. He was going nowhere and knew it.

Anyone who has lived in the north knows stories like that. However, his strong-willed mother, and an elderly grandmother, persuaded him to go back to school. Eventually, he went on to law school, and when he was called to the bar this year, he took his oath in Inuktituk, the language of the Inuit.

Then, a few days after becoming the north's first Inuit lawyer, he was elected the first Premier of the new territory of Nunavut, which came into being April 1st in Canada's vast eastern Arctic. Mr. Okalik immediately became a symbol of all the hopes and shortcomings of the bold experiment in self-determination that Nunavut represents:

At 34, he is the youngest Premier of any province or territory in Canada; Nunavut has the youngest population of any territory or province and, with that, high rates of unemployment and suicide.

Except for the election in February in which he won a seat in the territorial parliament, he has no political experience; Nunavut also is starting from scratch.

Many consider Mr. Okalik's newness to be both his greatest strength and most trou-

bling weakness; likewise, Nunavut can either forge a new path or head into disaster.

There is no lack of southern Canadians who see Nunavut as a well-intentioned but doomed effort, a territory born with almost total reliance on federal money and lacking the experience and skills to be run efficiently.

"That doesn't matter," Okalik said in an interview in his temporary office in Iqaluit, the capital city of Nunavut. Wearing a sealskin vest over a casual shirt and jeans, he spoke modestly about the obstacles he has overcome. "Inuit are used to those kinds of comments, and we don't mind. We like to prove everyone wrong whenever we can."

For generations, the Eskimos of Canada's desolate north demanded the chance to govern themselves. Through stubborn negotiations over many years, in which Mr. Okalik played a major role, the Eskimos managed to win a double victory that is now being watched by other native groups all over the world.

The Inuit won the largest land claim in Canada's history, gaining the right to some 770,000 square miles of tundra, ice and frozen islands. At the same time, they persuaded the Federal Government to split the Northwest Territories to create Nunavut.

While the new territory is not strictly limited to Eskimos—or Inuit, as they prefer to be called—it effectively is Inuit territory since 85 percent of the 27,000 residents are Inuit.

Mr. Okalik's odyssey through the alcoholism and despair that have ruined so many Inuit lives has clearly earned him the community's respect. And it is clear that what he accomplished, he did in the Inuit way.



Premiere Paul Okalik with constituent

PHOTO BY AGENCE FRANCE PRESSE

Expectations here are high, and some degree of letdown is inevitable, once the celebrations end. Mr. Okalik is focusing on developing economic opportunities for Nunavut's people, perhaps through fighting for an end to the United States ban on the import of sealskin like the vest he wears.

But for a man who knows what it is like to live without hope, opening a strong future for his people is most important.

"I hope that we can introduce high standards for future governments," Mr. Okalik said, "and improve our situation in Nunavut so that this will be remembered as a point in time when things changed for the better." □ (*Multiple contributors*)

Arctic Once Balmy, Croc-Like Fossils Indicate

Washington Times, 18 December 1998, p. A3—The frigid Arctic regions were as balmy as present-day Florida some 90 million years ago, according to researchers who found fossils in northern Canada of a crocodile-like animal.

At a place just 600 miles from the North Pole, researchers from the University of Rochester found the fossilized remains of the *champsaur*, a toothy, eight-foot-long extinct crocodile.

"We found a whole assemblage of fossils, from both young and adults," said geophysicist John H. Tarduno, the lead author of a study appearing today in the journal *Science*. "There were also turtles and fish."

The *champsaur* and the turtles are cold-blooded animals that could not have survived in the current climate of the Canadian Arctic where the fossils were found, Mr. Tarduno said.

"These fossils tell us that there had to have been

a substantial growing season there then, and that the climate was very unlike the arctic now," he said.

Temperatures at the fossil site now routinely drop to minus 60 degrees Fahrenheit in the winter. But when the *champsaur* lived there 86 million to 92 million years ago, temperatures rarely reached freezing and summertime readings of 80 degrees were common.

"We think it was typical of what Florida is now," Mr. Tarduno said.

No one had found a *champsaur* so close to the Arctic before, said David Weishampel, a Johns Hopkins University dinosaur expert.

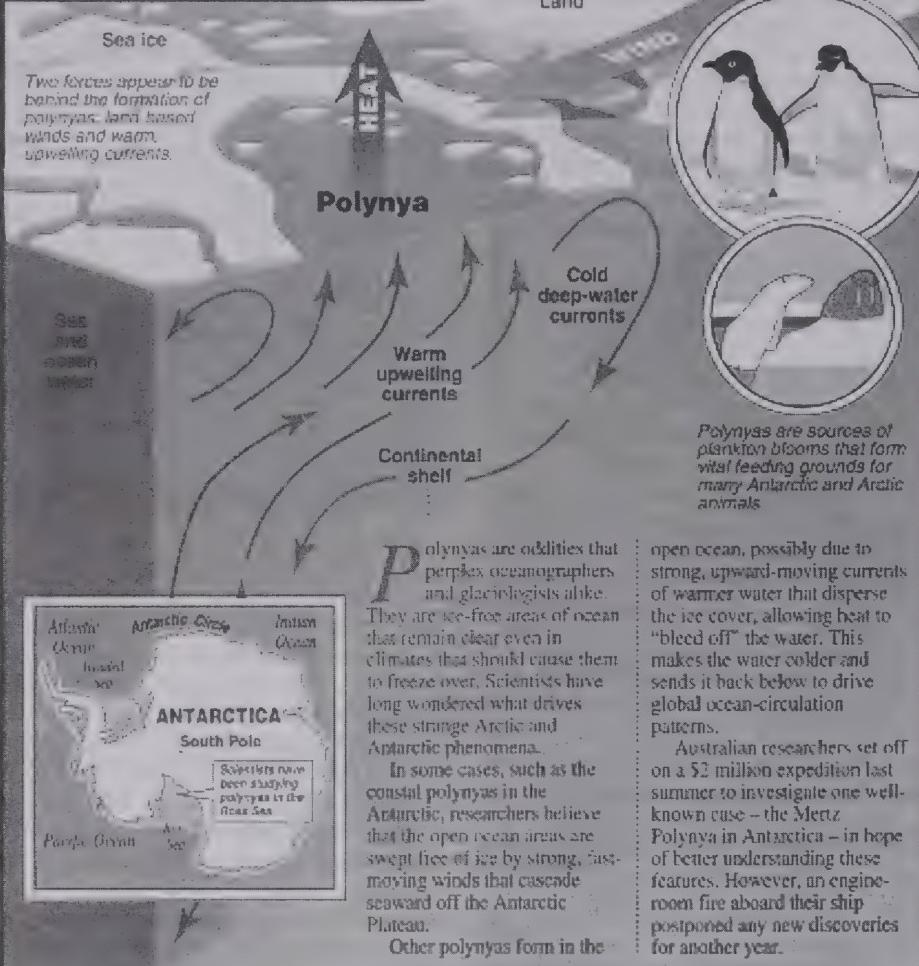
"The new find suggests that the poles were a lot warmer and more stable then than they are now," Mr. Weishampel said. □ (*cb Peter Barretta & Don Thomas*)

Humpback Recovery

Fairfax (VA) Journal, 30 October 1998, p. A2—The population of humpback whales is slowly recovering after reaching near-extinction 35 years ago, according to a report issued at the first international gathering of humpback whale experts in Brisbane, Australia. Commercial whaling during the period between 1949 and 1963 had caused a dramatic decline in the number of the marine mammals from 12,500 to 400. Since a ban ended commercial whaling in the Southern Hemisphere in 1963, their numbers have grown steadily back to approximately 2,500. The focus of the Brisbane report was on the endangered humpbacks that migrate from the Antarctic along the west coast of Australia, and those that travel from Antarctica to New Zealand and Tonga. □ (*cb Peter Barretta*)

GEOFACTS

What are polynyas?



Who'll Be First to 'Enter' the Next Millennium?

Antarctic, Vol. 16 No. 3, 1998-1999, p. 53

—A Canadian newsletter, "The Seventh Continent," reports that a new book pinpoints the South Pole.

Greg Wright of California suggests that "no one could be closer to the action than someone who is splayed out over the South Pole itself within the Amundsen-Scott station's geodesic dome—perhaps stretching a bit in the direction of longitude 180°."

His proposal for the World Millennium South Pole Sweepstakes is for an international body such as the UN to declare this spot "ground zero" and for it to organize a global competition for people willing to travel to the South Pole so that they could be officially declared the first person in the world to see the new millennium. (From *The Millennium—A Rough Guide to the Year 2000* by Nick Hann [Rough Guides Ltd 1998]) □ (cb Peter Barretta)

By Bill Pitzer and Earla Holland

Activists Try To Stop Antarctic Whaling Ships

The Associated Press, 7 December 1998, NOUMEA, New Caledonia — Greenpeace activists chained themselves to two Japanese whaling ships Monday to prevent their departure from New Caledonia. A pair of protesters chained themselves to the harpoon and anchor of the *Kyo Maru* while two others attached themselves to the mother ship, the *Nisshin Maru*. The *Nisshin Maru* was undergoing repairs at Noumea for engine trouble suffered when the ship caught fire last month.

The fleet was due to return to Japan on Monday for further repairs before resuming whaling in Antarctic waters in early 1999. Greenpeace said the protesters would remain chained to the vessels until there was a clear message from Japan that they would not go whaling this season. The environmental

organization said Japan had consistently ignored the internationally recognized Southern Ocean Whale Sanctuary declared in 1994 by the International Whaling Commission.

The environmental group also described Japan's whaling campaign as "commercial whaling draped in the cloak of science." The Japanese whaling ships, which left Japan on Nov. 6, hope to catch 440 minke whales this hunting season around Antarctica, the same number caught last year.

Commercial whaling on the high seas has been banned since 1986. But a small fleet of Japanese ships continues to kill whales and dolphins along the nation's coasts, and hundreds of whales are hunted on the open sea each year in what the government calls a research program.

Japan's whaling program has often been

North Slope Gets New Home to Celebrate Culture

Alaska, May/June 1999, p. 16

The North slope's first museum, the Inupiat Heritage Center in Barrow, opened in February.

The \$12 million center houses a 20,000-volume library; a studio where such traditional arts as dancing and sewing are taught; gallery space with exhibits; and a 25,000-item ethnographic collection.

Some of the more notable collections stored in the center are relics from the discovery site of the famous frozen family of ancient Inupiat found in Barrow in the 1980s. Harcharek, an Inupiat Eskimo, said the museum also contains 1,700 oral history tapes and 12,000 archival photos.

"This is a place where the Inupiat community can come and reattach themselves to their culture," said Ronald Brower Jr., the center's director. □ (cb Peter Barretta)

criticized because meat from the whales killed for research is sold on the open market, with proceeds going to the whaling industry. □ (cb Billy-Ace Baker)

Penguins Confront Extinction

The encroachment of breeding grounds and depletion of fish in oceans put 11 of 17 species in peril.

The Contra Costa Times, 6 December 1998, By Usha Lee McFarling, BOSTON—In a world of overfishing, marine pollution, oil spills, global warming and coastal development, the world's lovable penguins are fast disappearing.

In a startling report released Friday at the New England Aquarium, international penguin experts said 11 of the globe's 17 penguin species face extinction.

Just two years earlier, conservationists at the International Union of Concerned Nations had listed only five species as threatened.

Penguins are best known as Antarctic residents, but some species live off the coasts of Australia, New Zealand, South America and Africa.

Antarctic species, largely shielded from the direct effects of humans, are thriving. But the picture is dismal for species in more habitable realms.

Penguins, which swim along at about four mph, can't travel far for dinner and must rely on large fish supplies near their nests and chicks.

But fishing boats can easily beat penguins to the anchovies and sardine-like fish they hunt.

"They're basically not able to find enough food," said Robert Crawford, a penguin specialist with South Africa's Department of Environmental Affairs and Tourism.

Unlike their more adaptable gull counterparts, penguins can't shift to a new food supply, like human garbage. "Penguins have a much more specialized way of life," Crawford said.

In New Zealand and Australia, introduced predators like ferrets, cats and dogs can eat their way through penguin rookeries.

Cats have another indirect effect on penguins. One Australian cat-food fishery focuses on pilchard—a penguin favorite.

"If the cats don't eat the penguin chicks, they take the food out of their mouths," said Peter Dann, who researches Little Blue penguins in Victoria, Australia.

Oil spills also take a heavy toll on the sea birds: 40,000 are oiled each year off the Argentine coast, Williams said.

And ocean-borne pollution, like heavy metals, collects in penguins' abundant fat and can cause disease and disrupt reproduction.

As any visitor to a penguin colony can attest, the animals are prodigious (and smelly) producers of droppings, or guano.

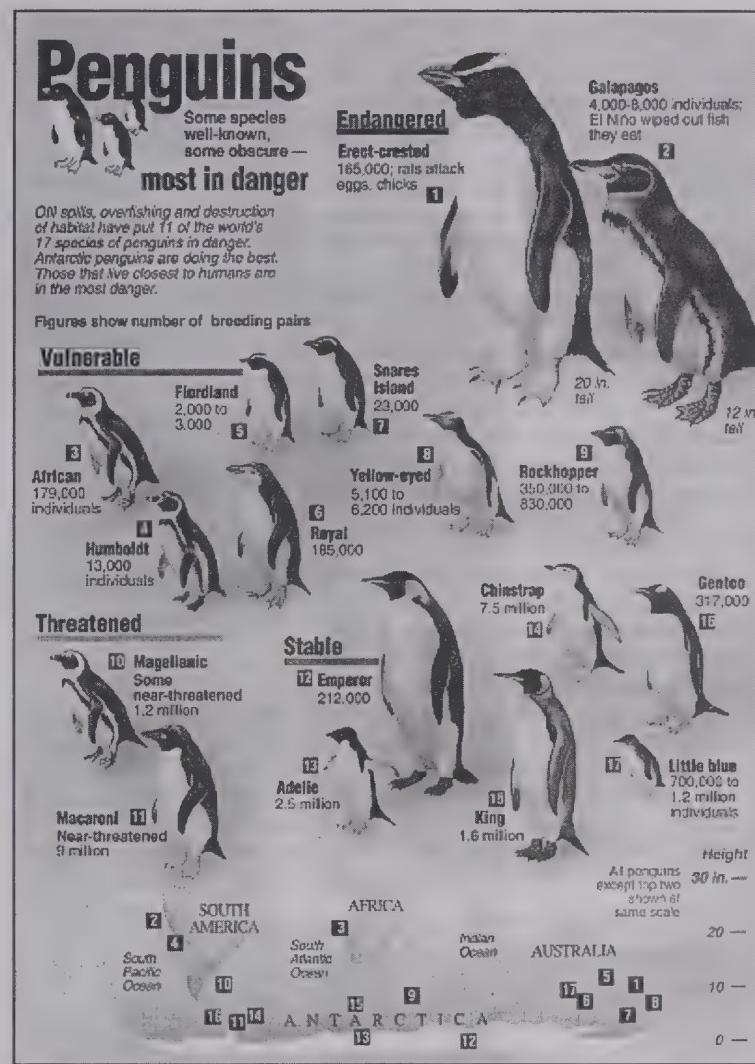
Because this guano is a rich fertilizer, it is periodically harvested from colonies

in Peru. Such harvests, though, harm penguins because the birds often burrow within guano piles to avoid being trampled or displaced by seals that seek breeding sites, eat penguins and compete with them for fish.

Antarctic species, largely shielded from the direct effects of humans, are thriving.

Penguins have also, unfortunately, become victims of their own popularity. In some cases, tourists have trampled eggs and disrupted breeding in misguided attempts to get close to the beloved birds.

Such tourism, though, also can help by increasing public awareness about the plight of the birds and raising money for their conser-



vation. "It's a double-edged sword," said Dann.

While Antarctic penguins are considered safe, the growing number of tour boats there is raising concerns of an oil spill in the pristine and remote region.

"There's always the chance of a disaster happening that can hit the concentrated breeding colonies on sub-Antarctic islands," said Williams, who organized the rescue of 10,000 South African penguins after a 1994 oil spill.

"We'd have very little chance of getting in to rescue and clean those penguins."

Penguin declines are of particular concern because they may reflect larger problems in the ocean environment, scientists here said.

Because they are large and well studied, penguins may merely be conspicuous indicators of more wide-ranging and less visible oceanic problems, for instance plankton declines or chemical contamination. □

(cb David Moyer)

Big Rigs Out On the Ice, Holding Their Breaths

New York Times, 22 March 1999, p. A1, by Anthony DePalma, ON THE YELLOWKNIFE-EKATI MINE ICE ROAD, Northwest Territories, March 15—He wants to hear what the ice says, so no matter how low the temperature gets, Peter Paul leaves his truck window open.

The sound changes. Sometimes it is like a real hard snap, he says, a cold thunder fired through the blue Arctic ice. Sometimes it is more brittle, like the dry crack of an ice cube when it breaks.

"That means it's okay," said Mr. Paul, who has been driving huge loads—like the 25-foot-wide, 118,000-pound dump truck bed lashed to his rig—up and down the Yellowknife ice road for 15 years. "It's when you don't hear anything that you start to worry."

During the coldest part of the tough winters here in Canada's remote Northwest Territories, when the crazy quilt of big lakes and small ponds in the region freezes over but the mines keep digging, men like Mr. Paul take their trucks off the regular road and onto a blue highway that crosses 400 miles of frozen lakes and bleached-out tundra.

The road is about money—the millions it costs to create, the many millions more it allows the mining companies to save by bringing in heavy equipment on trucks rather than in planes.

The season is short, from early February, when the ice turns solid down four feet, to late March or, if they are lucky, the first week in April, when the ice goes spongy, and silent.

But while the ice road is open, these tundra truckers will carry more than 1,200 heavy loads north. For the last two years, most have taken fuel and heavy equipment to Ekati mine near Lac de Gras, Canada's first diamond mine.

Mr. Paul said the prospector who found the diamonds advised him long ago to invest in the mine. Mr. Paul did not. "I'm not a gambler," he said.

Canadians have long exploited the hard flat surfaces of frozen lakes to travel in winter, but until recently they had never risked putting such heavy loads in such great numbers on the ice.

Today, says John Zigarlick, chairman of Nuna Logistics, which creates and maintains most of the road, global positioning satellites guide helicopters along a route across a lake. When the 'copter lands on the opposite shore, the plow operator heads toward its lights to keep the route true. Ice conditions are checked with radar, and water is sprayed on the surface, like re-paving.

It takes a special kind of driver to take a rig weighing over 150,000 pounds onto the



Mammoth rig entering lake ice super-highway

ice. "The first year I came up it was all the same as any other road until I heard the noise of the ice," said Billy Fitzgerald, 43, who brings his own truck out from Newfoundland to ride the ice roads. "It was almost like a pane of glass on a good frosty night, and I was saying to myself, 'What have I got into?'"

When it snows too much or blows too hard to keep the road open, the truckers hole up for a day or two at Lockhart Camp to wait out the storm. That is when the tables outside the always-open kitchen groan under the bombast and bragging about the ice road. They still talk about the time the three loads of silver ore went right to the bottom of Hottah Lake, or when Mr. Paul had to wait an hour and a half for a herd of caribou to cross.

They say the lakes are named for drivers who plunged through and felt the icy fingers of the water close around their hearts.

There is Pat's Lake, for one, and Pikrul Lake, where one unlucky soul named Doug Pikrul was said to have gone through twice in one day. They pulled him out, dried him off and sent him back on the road the next day.

The money is good, and the season is short. About half of the drivers come from Newfoundland, where there is no work ("That's 'cause it's all been done," Mr. Sparks said). They can return home with as much as \$25,000 for a little over two months' work. They cram in as many trips as they can, and only a near blizzard can keep the trucks idling.

As the days lengthen, and winter ends, the drivers start to pine for home. "Oh, when I'm driving back I'm thinking of me woman," Mr. Fitzgerald said. Then, inevitably, in the middle of summer, when he is on his patio, having a beer, he will tell a story about the ice and about the boys who ride the blue highway. □ (cb Peter Barretta)

Marriage at the Pole, Honeymoon at McMurdo

Antarctic Sun, 31 January 1999—Donna Aldrich-Hooker and Roger Hooker were married at 3 PM., Jan. 1, 1999, at the South Pole. They exchanged vows at the ceremonial pole with the station residents standing hand in hand around the flags in a circle of unity.

After being engaged for a year and a half, the decision to be married at the Pole was a spontaneous one. "There was no thought to it," Aldrich-Hooker said.

Aldrich-Hooker, a cook, and Hooker, an electrician, are both from Walden, Vt., and are new to Antarctica this season.

With pizza as the main course for their reception dinner and their wedding night spent in a jamesway hut, the couple enjoyed an "all-expenses-paid honeymoon" in McMurdo Station, Antarctica before returning to Pole Station for the winter. □ (cb Billy-Ace Baker)

Swingley Wins Iditarod 2nd Time



ASSOCIATED PRESS

Doug Swingley gets victory kiss from his lead dog after winning Iditarod.

New York Times, 18 March 1999, p. C28
Despite two broken sleds, Doug Swingley won the Iditarod Trail Sled Dog Race for the second time yesterday, completing the 1,100-mile Anchorage-to-Nome trek across Alaska in nine and a half days.

Swingley, from Lincoln, Mont., is the only non-Alaskan to win the race.

As he did in 1995, when he set the course speed record, Swingley relied on a fast, well-trained team as much as strategy decisions, such as when to rest or push his dogs.

Haggard-looking and unshaven, Swingley led his 11 dogs past a cheering crowd and through the finish chute at 1:31 AM. Alaska time. He completed the race in 9 days 14 hours 31 minutes.

The victory earned him \$60,000 and a new pickup truck to go along with the \$9,000 in bonus money he won along the way for leading at the halfway point, at the Yukon River and when the race hit the Bering Sea coast.

Nearly nine hours later, the three-time winner Martin Buser of Big Lake, Alaska, reached the finish. Swingley's victory margin is the widest since 1992, when Buser finished more than 10 hours ahead of the runner-up, Susan Butcher.

Swingley borrowed from a race strategy that worked for him in 1995—go further than the pack before taking his mandatory 24-hour rest, then outrun everyone else to the Bering Sea coast. □ (cb Peter Barretta)

USNS Henson Honors African-American Arctic Explorer

Pentagram, 27 November 1998, p. 5, by Keisha R. Ford—The Navy's newest oceanographic survey ship, which is named for a codiscoverer of the North Pole, spent last weekend docked in Alexandria, Va.

The USNS *Henson*, named after Matthew Alexander Henson, who reached the North Pole with Navy LT. Robert E. Peary, was docked from noon to 4 PM. Nov. 20 through Sunday at the Robinson Terminal.

A remembrance ceremony Saturday recognized Henson as "one of America's greatest Arctic explorers," said Allen Counter, director of the Harvard Foundation at Harvard University.

The Naval Order of the United States conducted formal military honors and a wreath-laying ceremony at Henson's gravesite at Arlington National Cemetery. The "Navy remembers Matthew Henson" was displayed on the wreath.

Olive Henson Fulton, the explorer's great niece, and her daughter, spent the night on the ship Friday as it traveled from Baltimore's inner harbor to Alexandria.

Retired Air Force Master Sgt. James Henson, Matthew's great nephew, said, "I am grateful to God and to the Navy" at the ceremony honoring his great uncle.

According to a 1988 article in *National Geographic Magazine*, Henson was born in Charles County, Md., in 1866, and after his parents died when he was young, he moved to Washington, D.C., to live with relatives. He shipped out of Baltimore in a merchant ship at 12 years old and, for about five years, learned mathematics, navigation and the Mandarin language.

In 1887, he met Peary, who signed him

up for his Arctic expedition team. This was the beginning of a long association between the two men in which they attempted to find the North Pole eight times—meeting success on their eighth attempt April 6, 1909.

Henson died in 1955 and was buried in Woodlawn Cemetery in New York.

According to a Navy news release, although Henson was eventually elected as an honorary member of the Explorers Club and awarded the Navy's silver medal, he was never given full public credit for his role in discovering the North Pole.

In 1988, Counter petitioned President Ronald Reagan to have Henson's remains reinterred with full honors in the Arlington Cemetery beside Peary.

Then Secretary of the Navy John H. Dalton chose the ship's name Dec. 4, 1994. Henson was chosen because he was an oceanographic explorer and because it was the Navy's newest oceanographic survey ship. In 1996, on the 130th anniversary of Henson's birth, the Navy christened the newly commissioned ship the *USNS Henson*.

The *Henson*, a 5,000-ton ship, is equipped with the latest survey technology, including physical, chemical and biological oceanography. It is a multi-mission ship that has the ability to survey in coastal or ocean waters.

Recently, Maryland Delegate Samuel C. Linton and James Henson located the explorer's birthplace in Charles County.

"Now that he's becoming famous, everybody so desperately loves him," Henson said. "I think he was a great man and he was loved by those who love him."

For more information, call Gail Cleere at (202) 762-1045. □ (cb Peter Barretta)



PHOTO BY SHANNON DUCKWORTH

The USNS Henson, the Navy's newest oceanographic-survey ship, sits dockside at Robinson Terminal in Alexandria. The 320-foot-long ship displaces 5,000 tons of water and is capable of doing 15 knots. It has a 25-person crew.

Norwegians Open Drive to Aid Their Needy Russian Neighbors

New York Times, 20 November 1998, p. A5, OSLO, Nov. 19 (AP)—Norwegians have opened a nationwide campaign to help their neighbors in Russia's impoverished Arctic region by providing food, warm clothing and medicine.

More than a million people live on the Kola Peninsula in northwestern Russia, the only place where the country borders a NATO member. The economic crisis in Russia has left thousands of Kola residents facing the bitter Arctic winter without heat or basic necessities.

The Norwegian Red Cross began a fund-raising drive today called Neighbors in Need, in which 2,000 volunteers will seek donations to help the Kola region.

"We hope the Norwegian people will reach out a helping hand to their Russian neighbors," said Sven Molleklein, secretary general of the Norwegian Red Cross. "The situation is extremely critical, and we have to act now."

More than 11,000 children and 33,000 elderly people in the region lack essential medicines, and food supplies are run-

ning dangerously low, Mr. Molleklein said.

The Red Cross hopes to provide shoes and clothing to 600,000 Kola residents, as well as nearly 500,000 boxes of food to 158,000 needy families in the next six months. Much of it will be distributed in Murmansk, the region's capital.

Norwegian aid groups, companies and individuals have been sending aid to the Kola region since the border opened up in the early 1990s. Norway increased its efforts, however, after the Governor of Murmansk, Yuri Yevdokimo, appealed for help in September on behalf of Kola's elderly and children.

Another group, Norwegian People's Aid, is urging Norwegians to pay \$13 at more than 1,300 stores to purchase a "Russia package" of food and other necessities to be sent to the Kola region.

The peninsula is the base of the once-powerful Russian North Fleet. In the Soviet era, its population swelled from a few thousand to more than a million when thousands of soldiers and others were sent there. □ (cb Peter Barretta)

Brutal Winter Adds to Despair of Siberian Villagers

Columbus Dispatch, 27 November 1998, p. 6B, by Dave Montgomery, KRASNY KAMEN, Russia —The temperature outside is 4 degrees below zero, and a brisk wind is sweeping down from the Sayan Mountains, across the snow-covered plains and into this struggling Siberian village.

Inside Svetlana Belinskaya's drafty, four-room cabin, a stray dog boils in a stewpot. Soon it will be the main course for her children, along with meager portions of pig feed and the last handful of emaciated potatoes from a dirt cellar under the floorboards.

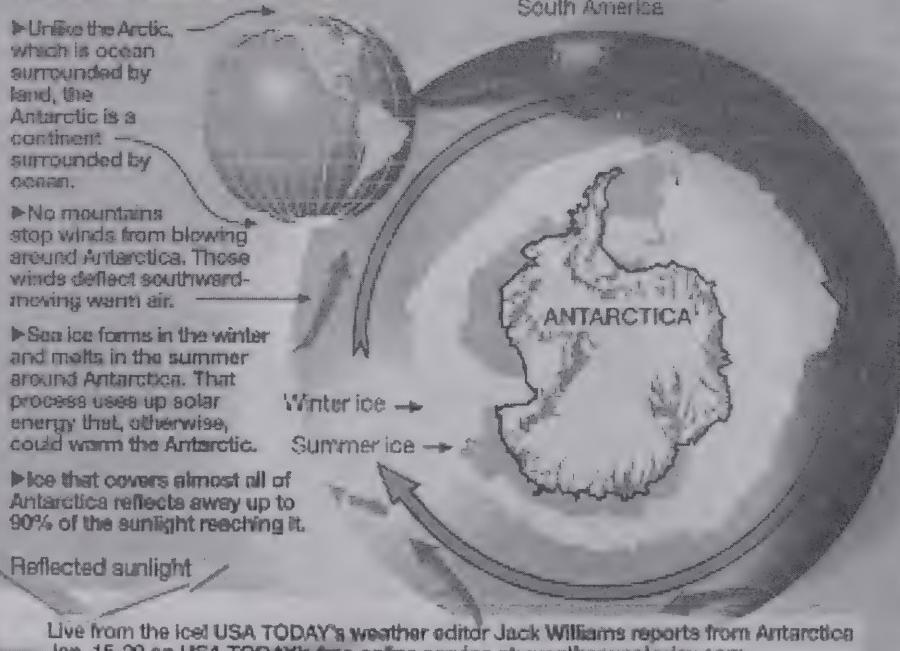
The 29-year-old mother of three sobs and runs into another room, staring out at the bleak landscape as she considers the uncertain days ahead. "We just wanted to be like normal people, to build a home, to raise our children," she says. "Now I don't even have money for aspirin. At least we're not stealing things. Not yet. But we will, if we have to."

Winter, Russia's constant companion and its ally against Napoleon and Hitler, is now the enemy. The coldest weather in 30 years has descended on northern Russia, magnifying the shortages of food, fuel, medicine and other necessities wrought by the country's prolonged financial turmoil. Here in the republic of Khakassia, an immense Siberian outback with nearly a half-million people, the despair is brutally evident in villages such as Krasny Kamen. There have been no confirmed reports of starvation, but many people say they are running out of food.

Earlier this year, grueling natural disasters—drought and floods—savaged the country's wheat and potato harvests, the staples of life in rural Russia. Although food aid is on its way from the United States, millions of impoverished Russians are facing the winter months with little to put on the table or wear on their backs. □ (cb Peter Andersen)

Antarctica much colder than the Arctic

Almost the same amount of sunlight reaches the top of the atmosphere above the regions around the North and South poles each year. But the Antarctic, the region around the South Pole, is much colder than the Arctic.



By BOB LAND AND GRANT JERDING, USA TODAY

The Ice

Out of whose womb came the ice?

And the hoary frost of Heaven, who hath gendered it?

The waters are hid as with stone.

And the face of the deep is frozen.

—The Book of Job
Chapter 38, Verses 29-30

Ancient Antarctic Environments Rocked by Volcanic Eruptions

Antarctic (New Zealand Antarctic Society), Vol. 16 No. 3, 1998-1999, p. 53 — A scientific study of rock cores presently being drilled from the bottom of the western Ross Sea, Antarctica, has unexpectedly recovered the first evidence of large volcanic eruptions that occurred in the area around 25 million years ago.

The evidence of this activity is contained in layers of volcanic debris that were erupted explosively into the atmosphere and then settled through the air and the ocean onto the seafloor.

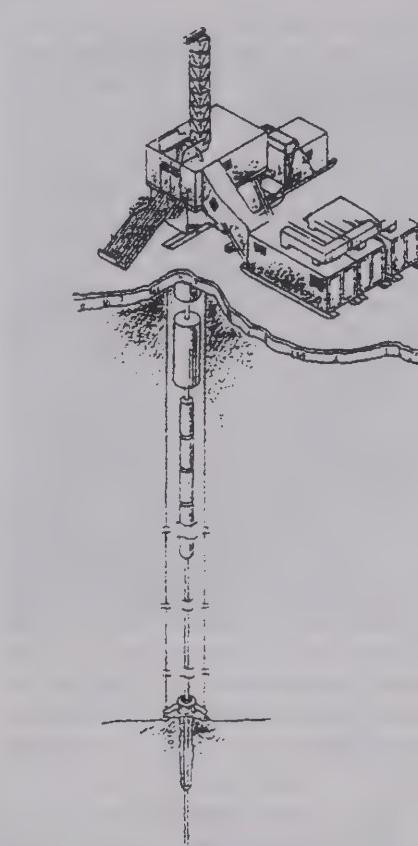
The thickness and coarseness of the main debris layer indicates a large volume eruption that generated an ash cloud reaching 50 to 70 km into the stratosphere.

The discovery of these volcanic layers demonstrates a far more spectacular history of volcanic activity than was previously suspected for the Ross Sea region of Antarctica, but is also useful because it provides material for accurately dating the strata.

For the past two Antarctic field seasons, scientists from Australia, Britain, Germany, Italy, New Zealand, and the United States have been coring the sea floor off the Victoria Land coast near Cape Roberts.

The Cape Roberts Project is designed to study the climatic and geologic history of Antarctica during the last 100 million years.

Drilling this year had reached a depth of approximately 110m below the seafloor when this unexpected evidence of volcanic activi-



ity was encountered.

The eruptions record in this core probably had a significant impact, not only on

the Antarctic environment, but also on the global environment of the time. Modern examples, such as Mount Pinatubo, a much smaller event, cooled world climate by 0.5 degrees for a year after its 1991 eruption.

The volcanic layers will be used by Cape Roberts Project scientists to determine the age of their strata more accurately, because volcanic debris can be dated precisely using isotopic techniques.

In addition, future coring in the area may encounter these volcanic layers in other drill holes, and they are distinctive levels that can be used to link strata of the same age.

The presence and thickness of these volcanic layers provide important new evidence about the history and style of large volcanic eruptions in this portion of Antarctica.

The National Science Foundation (NSF) is a partner in the Cape Roberts Project.

Scott Borg, who heads the geology and geophysics program for NSF's Antarctic Science Section, said these eruptions are believed to have significantly altered global temperatures at the time.

"The discovery of the volcanic material is really quite exciting," says Borg. "It is clearly evidence of a major eruption, several times larger than Mount St. Helens (in Washington State) and possibly comparable with the eruption that destroyed Pompeii."

□ (cb Peter Barretta & Billy-Ace Baker)

Editor's Note: Progress on this project may be followed at www.antarcticanz.govt.nz/

Hunters Get OK To Shoot Snow Geese

Associated Press, by H. Josef Hebert, WASHINGTON — The government gave hunters new freedom Friday to shoot hundreds of thousands of additional snow geese as they migrate north — an attempt to protect imperiled Canadian tundra from the birds' voracious appetites.

The Interior Department said it will allow 24 states to ease restrictions on the hunting of snow geese, hoping to double the number killed during their upcoming spring migration.

An estimated 1.2 million birds are expected to be shot, officials of the U.S. Fish and Wildlife Service said. Over the past three decades, the population of snow geese has exploded from 800,000 birds to an estimated 5 million.

While endorsed by many conservation and hunting groups, the plan was immediately denounced by the Humane Society of the United States. It promised a lawsuit, saying the expanded hunt violates laws protecting migratory birds.

The easing of the rules takes effect Tuesday and is the beginning of a campaign to ad-

dress what has emerged as a major environmental concern -- the destruction of thousands of acres of tundra and salt marshes in Canada's Hudson Bay area.

The area is the summer breeding ground for snow geese, which are white with black wing tips and considerably smaller than better-known Canada geese. During the warm months, the birds grub into the tundra, destroying plant roots and the area's thin layer of topsoil. That disturbs the feeding grounds for other migratory birds.

"If we do not take action, we risk not only the health of the arctic breeding grounds, but also the future of many of America's migratory bird populations," said Fish and Wildlife Director Jamie Rappaport Clark.

The new rules allow states to extend the goose hunting season and let hunters use now-banned electronic goose calls. It also will free hunters to carry more shells in their shotguns, increasing their firepower.

Federal officials say their goal is to cut the number of breeding snow geese by 50 percent,

a task expected to take five to seven years even under the aggressive campaign of expanded hunting and other measures.

The agency plans a broader environmental assessment next year to determine what future steps to take to reduce the bird population, including possibly killing young birds in their Canadian breeding grounds.

Conservationists say the problem is really of society's making. Each winter the geese gorge themselves on the abundant grains and friendly environs of America's agricultural heartland, growing so hardy they are now able to withstand the harsh arctic climate. The average age of a snow bird is eight years, biologists say.

Actions to reduce snow geese numbers — including less restrictive hunting — have been endorsed by conservation groups such as the Audubon Society as well as Ducks Unlimited, whose members include many hunters.

"Simply letting nature take its course is no longer valid," said Frank Gill, senior vice president of the Audubon Society. □ (cb Billy-Ace Baker)

Multinational Rescue Ends in Success

USA Today, 1 February 1999, by Jack Williams, McMurdo Station, Antarctica—McMurdo Station, Antarctica—Flight crews, medical workers and others from at least six nations, including the USA, succeeded in transporting a seriously ill member of an Indian research group all of the way across Antarctica to a hospital in New Zealand.

The victim, whose name and age are not available, is on life support Christchurch Public Hospital.

He was with researchers from India aboard the Norwegian ship the MV (Motor Vessel) *Polar Bird* when he suffered complete paralysis of his left side on Friday.

About 1:30 AM. Monday, a series of flights brought the victim to the U.S. McMurdo Station. Physicians say he was in stable condition as he then was flown to New Zealand late Monday afternoon on an Air Force C-141 flight. An ambulance met the plane in Christchurch, whisking the victim to the hospital.

The rescue began at 3:47 PM. Friday when an e-mail from the Indian Maitri Research Station, with "SOS" in the subject heading, arrived at the McMurdo National Science Foundation (NSF) office at McMurdo. David Bresnahan, the NSF representative in Antarctica, began making telephone calls to stations around the continent to set up the rescue.

"There was no hesitation," Bresnahan said. "This kind of scenario is something we've been called on to do in the past. If it's life-threatening, we do what we can, but we do have to consider the danger to our crews."

Bresnahan said physicians caring for the victim, think he suffered a stroke.

When the man became ill, the *Polar Bird* was near the Indian Maitri Station, which is on the opposite side of Antarctica from the U.S. McMurdo Station.

On Saturday a helicopter from the *Polar Bird* carried the victim to the South African Research Station at Sanae. From here, a South African helicopter carried him to the Ger-

man Neumayer Research Station. The Germans put the victim on their Dornier twin-engine airplane, which carried him to the U.S. South Pole station after refueling at the British Halley Research Station.

A U.S. LC-130, with an American physician aboard, flew the victim from the South Pole to McMurdo.

A Royal New Zealand Air Force helicopter based at Scott Base, about two miles from McMurdo, then picked up the victim and flew him from McMurdo 10 miles to an ice runway where an Air Force C-141 transport from Christchurch had just landed.

The victim remained on a stretcher the whole time. The C-141 made the last leg to Christchurch.

The flights across Antarctica totaled more than 2,000 miles and Christchurch is about 2,400 miles from McMurdo.

Bresnahan said that when he started calling other research stations around Antarctica Friday afternoon, it was the middle of the night at the stations on the other side of the continent. □ (cb Peter Anderson)

Dutchman Discoverer of Antarctica?

Associated Press, by William J. Kole, 18 December 1999, AMSTERDAM, Netherlands—A Dutch sea captain's ominous descriptions of a gigantic icy land mass four centuries ago have some scholars convinced that he's the man who really discovered Antarctica, 221 years before the Russian and Englishman who are credited with the discovery.

Notes penned in 1622 by the Amsterdam merchant who bankrolled the voyage mention how Dirck Gerritsz described seeing the land mass in 1599, a year after he sailed from Rotterdam, Dr. Wim Ligtendag of Groningen University's Arctic Center said Friday.

The merchant, Isaac Le Maire, wrote how Gerritsz's weather-beaten ship, *The Flying Heart*, had been driven far south of Cape Horn by a strong north wind that had blown for weeks.

"At 64 degrees south of the Strait of Magellan, he saw a mountainous land, like Norway, entirely white with snow and so extensive that it seemed as if it stretched as far as the Solomon Islands," Le Maire wrote.

If true, it means that Antarctica wasn't discovered by Edward Bransfield, an Englishman, and Thaddeus von Bellingshausen, a

Russian admiral, who share the credit for making the continental discovery two centuries later in 1820. An American, Nathaniel Palmer, also claimed a sighting in 1820.

In the past, Le Maire's account was brushed aside as hearsay by historians who didn't find it convincing enough. Ligtendag said his research has established that Le Maire and Gerritsz were probably in close personal contact, adding weight to the writings.

That a Dutchman could have discovered Antarctica isn't out of the question . . .

The Flying Heart, also called *The Glad Tidings* in some documents, was one of six ships Le Maire commissioned in 1598 to search for a sea route to India.

"One can't completely dismiss it, but one puts it on the 'extremely unlikely' list," said Robert Headland, archivist and curator of the University of Cambridge's Scott Polar Research Institute.

The Dutch study, commissioned by the

Netherlands Organization for Scientific Research, will be published in "The Discovery of the Far South: The History of Antarctica as Revealed by Old Maps and Charts," a new book by Ligtendag.

That a Dutchman could have discovered Antarctica isn't out of the question, considering that the Netherlands was a world power in the 16th and 17th centuries and the Dutch East India Company dominated ocean trade.

It was a Dutchman, explorer Abel Tasman, who discovered New Zealand in 1642 and named it after his home province of Zeeland.

Gerritsz and six of his crew were captured by the Spanish not long after their sighting and were held as prisoners for several years, making no mention of their discovery to the Spaniards Ligtendag said.

After the Spanish released Gerritsz in 1604, he became a merchant in the Dutch town of Enkhuizen, next door to Hoorn where Le Maire was based. Merchants in the neighboring towns were well-acquainted with one another and frequently collaborated on expeditions, Ligtendag said. □ (*Multiple contributions*)

Port Lockroy

Most Popular Place in Antarctica

by Dave Burkitt
Station Manager Port Lockroy

Towards the end of World War II the British Admiralty set up a secret naval operation code named *Tabarin*. The plan called for establishment of two bases in the Antarctic Peninsula to provide meteorological information in the South Atlantic Sector. One of the sites chosen was an old whaling station at Port Lockroy.

Lcdr Marr, who had been a member of Shackleton's Quest Expedition in the 1920's was selected as the leader of the first team of eight men, military and scientists. It was officially called Base A, but more widely known by those who served there as Bransfield House. It was manned continuously until after the International Geophysical Year serving as a platform for ionospheric experiments and other studies. In 1962 the base was closed and the British moved to the Argentine Islands.

Sadly the base fell into disrepair, but in 1994 it was designated an International Historic Site by the Antarctic Treaty Parties. This gave impetus to clean-up and rebuilding operations.

Today the station is spruced up and since it is at the hub of shipping operations in the Antarctic Peninsula most tourist ships stop for a visit. In the 1997-98 summer season there were 58 ship visits carrying over 6400 people.



Port Lockroy Station Headquarters

Management of the site has been handed over to The United Kingdom Heritage Trust. A two man party has been deployed each summer to act as caretakers of the station; the cost of the operation being met by profits made by manning a gift shop and post office.

Since the station is situated in the midst of a gentoo penguin rookery a resident biologist has been assigned to study the impact of large groups of tourists walking through the nesting sites. After three years of observation there doesn't appear to be any adverse effect.

I have spent the last four summer seasons at Port Lockroy and have witnessed the steady increase of visitors. Indeed, it is reckoned by many, to be one of the highlights of their Antarctic cruise. For the record, I have never had to caution anyone about their behavior and am impressed with the cruise ship operations and management by the management of shore visits by ship expedition staffs. I get the feeling that a lot of the passengers return home as good ambassadors for the Antarctic environment. □

Editors Note: Mr. Burkitt, an old British Antarctic Survey member, has been the station leader at Port Lockroy since restoration began. He not only has done an outstanding job restoring the station as a historic site, but has set an outstanding example in management and environmental education of visitors to Antarctica. Our hats are off to him.



Antarctic Telescope Sheds Light On Universe

National Science Foundation, 18 December 1998—Researchers from Carnegie Mellon University, using a National Science Foundation (NSF) microwave telescope in Antarctica, have made a crucial measurement of cosmic background radiation that may help science to settle a fundamental question of whether the universe will expand forever or collapse back upon itself.

Scientists measured the dimensions of extremely distant gas clouds with the Viper Telescope, operated by the Center for Astrophysical Research (CARA) in Antarctica at Amundsen Scott South Pole Station (See background article PT, Vol2, No.12, p.6).

"These findings indicate that the material of the universe was given just the right kick by the Big Bang to expand forever, never collapsing, but also never becoming so dilute that gravity can be ignored," according to Peterson. Viper is used to make images of the faint structure, an anisotropy, seen in the sky. The anisotropy measurement is just a small part of the data collected from the telescope, which provides a snapshot of the universe as it was 300,000 years after the Big Bang, the cataclysmic event that set in motion the forces that created today's universe.

Previous cosmic background telescopes have been smaller than Viper and have not been able to focus in fine enough detail to measure the clouds as Viper can. However, the CARA group's work with these earlier prototypes was critical to the new discovery. Karl Erb, the Director of NSF's Office of Polar Programs, said "This advance is a fitting testament to the vision and dedication of the CARA scientists whose work proved that the South Pole is an ideal site for these delicate measurements." □

(cb Billy-Ace Baker)

Russia: Navy's Whales Discharged

New York Times, 18 November 1998, p. A8—The cash-strapped Russian Navy has closed a Pacific base that trained whales for combat purposes and sent the last trainees, five belugas, to a civilian research center on the Black Sea. The base at Vityaz Bay was used to teach whales to detect enemy divers and carry out other tasks. □ (cb Peter Barretta)

The Arctic Sketches of Russell W. Porter

By Mary C. Ryan



Eskimo Girl by Russell W. Porter—1896

One of the most exciting aspects of historical research is coming face to face with tangible evidence of past lives. Through sitting in a research room, one is transported to a different time and place, sharing the excitement, hardships, and hopes of journeys long past. Such an experience occurs in the study of the papers of Russell Williams Porter (1871-1949), one of several turn-of-the-century explorers who ventured into the alien regions above the Arctic Circle in a quest to reach the North Pole.

Porter made the trip six times between 1894 and 1903 and left an impressive collection of paintings, drawings, notebooks, journals, and correspondence. One can appreciate Porter's sketches and paintings on many levels: as skillful and beautiful representations of the peoples and lands of the North; as documentation of episodes from the journeys; and, when one realizes that many of the sketches were drawn in subzero temperatures, as testament to the stamina of the expedition members.

The Papers of Russell Williams Porter, 1893-1949, are found among the National Archives Collection of Donated Materials. Some of his sketches can also be viewed at www.nara.gov/publications/prologue/porter1.html □ (cb Peter Anderson).

Logs of Ice May Teach a Lot About History

Scientists make progress in Antarctica

Wisconsin State Journal, 24 January 1999, by Robert S. Boyd, SIPLE DOME, Antarctica—Antarctic scientists achieved a significant advance here Saturday in an effort to understand Earth's past and predict its future.

After three years of arduous toil, drillers reached bedrock almost two-thirds of a mile beneath Siple Dome, an immense bulge of ice 500 miles north of the South Pole on the western edge of this frozen continent.

As they drilled, they pulled up an almost complete column of ice, 5 inches in diameter, in pieces 1 to 5 yards long, containing a record of 80,000 to 100,000 years of the world's hot and cold spells.

Bubbles of ancient air, dust, volcanic ash and other chemicals trapped in these sleek ice logs hold clues to past glacial ages and periods of global warming, according to Gregg Lamorey, science coordinator for the Siple Dome project.

"It's a detective story," said Lamorey, bundled in a thick parka against the cold. "There are lots of pieces to the puzzle."

The job took a year more than scheduled. Bad weather and mechanical problems allows only the topmost 150 meters to be drilled last year. This year it was a race against time, since Monday was the last day before the oncoming end of the brief Antarctic summer would put an end to the drilling.

When word came that the drill bit hit bed-

rock, Tod Purdom, a researcher with the United States Geologic Survey in Denver, rushed into the galley shouting, "We hit bottom!" Off-duty workers and scientists burst into cheers and applause.

About 6 inches of fresh ice accumulates on the surface of this bleak landscape each year. But at the bottom of the drill hole, the enormous weight of the ice—1,200 pounds per square inch—squeezes a century's precipitation into an inch-thick pancake.

"Annual layers of ice lie on top of each other like a stack of annual weather summaries," Lamorey said.

The bottommost portion of the core was created when Neanderthals roamed Europe and human ancestors, Homo sapiens, had not yet left the plains of Africa.

The Antarctic ice cap, half as large as the United States, lies partly on top of solid rock, partly over the southern ocean.

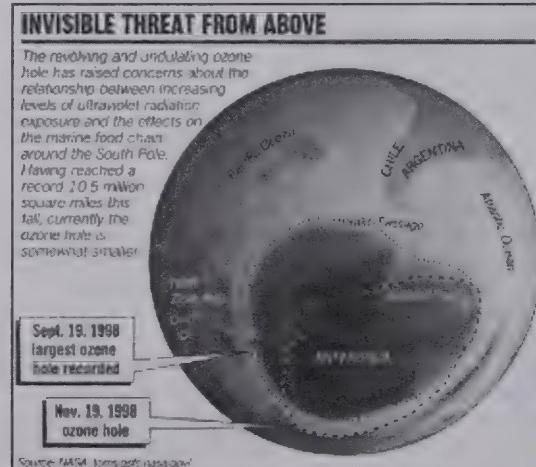
The Siple Dome project, sponsored by the National Science Foundation in Washington, is designed to help determine whether the ice cap ever disintegrated entirely, at least in West Antarctica.

There is considerable evidence that the ice did vanish about 125,000 years ago, and reason to believe that it may do so again, raising sea level worldwide.

Scientists hope to dig up several feet of the underlying bedrock next year. □ (cb John Ong)

U.N. Says Ozone Hole Long-Lasting

Associated Press, 5 December 1998, GENEVA —The ozone layer over Antarctica has stayed over a large area for



longer than in any recent year, according to the World Meteorological Organization.

During November, the area covered by the hole stayed at 5 million square miles, the U.N. weather agency's latest Antarctic Ozone Bulletin said.

WMO scientists expect this year's hole to be about as big as has ever been detected in the protective ozone layer since international measurements began in 1991.

It said the hole was off to a strong beginning because the whirlpool-like wind that develops in the stratosphere above the South Pole is very strong this year.

The agency added that the hole will not enlarge out of the Antarctic, but may reach the southern tip of South America as it has at times previously.

It is expected to stay over the Antarctic from August until December, as in other years. □ (cb Billy-Ace Baker)

Charting a Polar Meltdown

Navy scuttles aid for climate research in Arctic



U.S. News & World Report, "Science and Ideas," 21 December 1998, p. 57, by Charles W. Petit—Confronted by disturbing evidence that the vast Arctic icecap is shrinking—melted from above by warmer polar air and from below by a recent surge of relatively balmy Atlantic Ocean water—scientists fear they could lose their best tools for keeping an eye on it: nuclear submarines. “They are wonderful platforms. A transit that would take months by icebreaker you can do in five days in one of these things,” said Robin Muench, a veteran of several submarine trips under the ice and a senior scientist at Earth and Space Research, a Seattle-based nonprofit organization.

The problem: The Navy is pulling the plug on Scientific Ice Expeditions (SCICEX), a program that started in 1993, when the Navy welcomed five civilian scientists aboard the *USS Pargo*, an aging, Sturgeon-class attack submarine. That year, the *Pargo* spent just 17 days under the Arctic ice. But the scientists were hooked. In the sub they traveled at nearly 30 mph, deployed instrumented probes, ran multiple sonar measurements and ranged as deep as 800 feet. The Navy agreed to provide annual science-only cruises at no cost.

Thin Ice

But next year’s SCICEX in March on the *USS Hawkbill* is to be the last. The Navy is decommissioning its handful of remaining Sturgeon subs, built more than 20 years ago. Its attack sub fleet, which is to shrink to 50 boats from 94 a decade ago, will be mostly larger, newer Los Angeles-class boats, and may be too busy for scientific cruises, Navy officers tell the scientists.

At last week’s meeting of the American Geophysical Union in San Francisco, scientists lamented the loss of the subs at a time of increasing evidence of a big polar thaw. Since the late 1980s, the ice atop the Arctic Ocean has thinned by about a foot, to around 6.5 feet thick. In places,

the front of the permanent ice has retreated 100 miles north. A current of saltier, warmer Atlantic Ocean water that extends into the Arctic mainly from the Barents Sea, has expanded dramatically, accelerating ice breakup. While recent warmth in the United States has everybody talking, the Arctic transformations “are astonishing. You just shouldn’t see changes in ocean basins like this,” said Garrett Brass, executive director of the U.S. Arctic Research Commission.

Many researchers think the changes to the far north are the result of global warming; others believe they are merely a phase in a natural cycle. Most scientists agree that they need about 10 more years of continuous monitoring to decide for sure. Delicate negotiations are underway to try to persuade the Navy to at least occasionally run a Los Angeles-class sub under the ice with scientists on board, or keep one Sturgeon-class boat operating just for science. Others are wondering if non-nuclear robot subs can take up the slack. James Baker, head of the National Oceanic and Atmospheric Administration, says talks are under way with the Russians to use one of their nuclear subs, but immense political and technical barriers could scuttle that effort.

Open Ocean

If snow-covered polar ice, one of the most reflective substances on Earth, is replaced by dark, open ocean, the planet’s thermostat could really go out of whack. Storm patterns and ocean circulation could drastically change, particularly in the North Atlantic. In recent years, evidence gathered from layers in Greenland’s icecap suggests that the global climate can change drastically in just a few decades. Or, as oceanographer Wieslaw Maslowski of the Naval Postgraduate School in Monterey, Calif., puts it, “If you stop forming ice in the Arctic, it screws up everything.” □

(Multiple contributors)

Obituaries

Edgar Nollner, 94, dies; Hero in Epidemic

New York Times, 24 January 1999, by Robert McG. Thomas Jr.—The tale has often been told, but when Edgar Nollner died on Monday, January 13, 1999, at his home in Galena, Alaska, it seemed time to tell it once more: Mr. Nollner, who was 94, was the last of the 20 intrepid mushers and more than 150 dogs who became national heroes in 1925 when they made their way in relays through raging storms over 674 forbidding miles to save a town and carve a legend in the snow.

Reporting several cases of diphtheria, a highly contagious and often fatal respiratory ailment, and two deaths, Nome’s only physician, Dr. Curtis Welch, who was rapidly using up Nome’s 7,500 units of six-year-old antitoxin, issued an urgent appeal for more of the serum, the only hope, he warned, of averting a full-scale epidemic in a community whose large Eskimo population had proved vulnerable to alien diseases.

Delivery by air seemed the obvious answer, but with Alaska’s only two planes, both open-cockpit models, crated for the winter, the territorial governor, Scot C. Bone, knew such an effort would be futile—and in the frigid, windy weather, almost certainly fatal. He was willing enough to let pilots risk their lives, but he would not risk the serum.

So, turning to a more reliable, 19th-century technology, he ordered the serum sent by rail from Anchorage to Nenana, 298 miles to the north. From there, it would be a matter of men and their dogs in relays over the Iditarod Trail.

Like others, Mr. Nollner, who ran his leg at night, covering the 24 miles from Whiskey Point to Galena in three hours, reported so much blowing snow that he could not see his dogs but really did not need to. The dogs, led by his trusty Dixie, knew the trail and never faltered.

Despite the end of the dog sled era, Mr. Nollner did not abandon his dogs and sleds right away, nor did he abandon saving lives.

In February 1953, when gathering wood with his dog team, he heard an Air Force plane crash. Finding two wounded officers on the verge of freezing to death in temperatures 54 degrees below zero, he built a fire and called his friend Charlie Evans to help him get them to town. A quarter-century later, when one of the officers, Lionel Levin, tracked him down, Mr. Nollner told him it had simply been a day’s work. (*See related story in Vol. 2 No. II, p. II, of The Polar Times.*) □ (cb Hal Vogel)

Joe Taylor Wyatt, 79, Electrical Design Engineer, Worked in Antarctica

Atlanta Journal-Constitution, 1 Mary 1999, by Rachel Tobin—College acrobat and senior electrical engineer Joe Taylor Wyatt, 79, of Marietta, visited the South Pole five times.

Mr. Wyatt died of cancer Friday at Kennebunk Hospital. The funeral was at Mayes Ward-Dobbins funeral Home.

A senior electrical design engineer with Lockheed Martin Aeronautical systems in Marietta, Mr. Wyatt went on five rescue missions to Antarctica with the U.S. Navy to extract three LC-130F Hercules transport planes owned by the National Science Foundation.

Mr. Wyatt helped develop the \$38 million planes’ electrical systems. His first mission was in 1975, and his last, in 1988, successfully freed a plane buried in ice and snow drifts for 16 years.

Mr. Wyatt, 69 at the time, had to pass a Navy physical examination to prove he could handle the harsh weather before his last mission.

In lieu of flowers, the family requests contributions be made to the American Cancer Society, Cobb County Unit, 1800 Water Place, Suite 245, Atlanta GA 30339. □ (cb Allan Gardner)

Thomas Manning, 86, Explorer Known as Lone Wolf of Arctic

New York Times, 25 November 1998, by Michael T. Kaufman—Thomas Manning, an explorer known as the lone wolf of the Arctic who followed his dog sled and camped in igloos to map desolate reaches of the far north of Canada, died on Nov. 8 in the hospital in Smiths Falls, Ontario, near the gentleman’s farm that he had in Merrickville. He was 86.

A frequently solitary wanderer, Mr. Manning rarely seemed to need the comfort of conversation and used words sparingly. Consider a message that he asked a passing Eskimo to carry by dog sled to a radio transmitter where it could be sent by Morse code to Montreal. The message, in 1938, was intended for Ella Wallace Jackson, a woman from Nova Scotia who was called jack, and it said, “If wish join me Cape Dorset for two years I

shall be pleased. Think well. Fools rush in."

Though pithy, it proved persuasive. Miss Jackson, whom Mr. Manning had met three years earlier, arrived above the 75th parallel to marry him and to spend a prolonged honeymoon of a year and a half mapping the coast of Baffin Island.

In contrast to her laconic husband, Mrs. Manning, who survives him, not only amassed, but also recounted the couple's Arctic experiences, writing "Igloo for the Night" in 1943, and "A Summer on Hudson Bay" in 1949. In "Igloo" she described the long months that she and Mr. Manning spent without seeing any other person until Mr. Manning had a dream that impelled them to head south by dog sled to the Eskimo settlement of Cape Dorset. They arrived on Jan. 2, 1940, to be told that World War II had begun.

Eager to participate in the war effort, Mr. Manning continued around the Foxe Basin on a journey by boat and dog team that covered 2,500 miles and lasted just over a year.

When he arrived at Churchill, Manitoba, for a train to carry him south from Hudson Bay, he met a United States Air Force officer who asked whether the story he had heard from Eskimos about Mr. Manning's killing a polar bear with a boning knife was true. Mr. Manning replied, "It was not a very big bear."

He subsequently enlisted in the Royal Canadian Navy and helped direct the building of arctic airfields and worked on developing cold-weather clothing.

Among his ventures was an expedition in 1949 on which he discovered an Arctic island that was later named for Prince Charles. In 1952, Mr. Manning and a young colleague, Andrew Macpherson, tried to circumnavigate Banks Island by canoe and chart its coast. They were engulfed by ice close to the spot where, in 1853, the explorer Robert McClure and his men had to abandon their ship.

Mr. Manning and Mr. Macpherson similarly headed overland, pulling their meager rations on sledges made from barrels left by the McClure party. They walked through snow and marsh for 14 days and Mr. Manning suffered snow blindness before a trading schooner picked him up. The next year Mr. Manning returned to complete his canoe trip.

He donated his library of several thousand books to the Eskimo community of Ikalhuit on Baffin Island and shortly before his death he presented \$1,000,000 to Cambridge University to go toward the new Shackleton Library at the Scott Polar Research Institute. □

Editor's Note: Mr. Manning was elected an Honorary member of the American Polar Society in 1997. He was too ill to attend the awards dinner last October; however, Graham Rowley, his long-time sledging companion hung his Honorary membership Medallion on his casket at the funeral.

Polar Air Pioneer MGen Chester McCarty dies at 93

By Brian Shoemaker

Air Force Major General Chester McCarty died on April 5 1999. He was 93. Gen. McCarty is best known as one of the leading generals under General Curtis LeMay in the bombardment of Nazi Germany during World War II and during the Korean War where he commanded the 315th Air division logging 469 hours in combat. He was one of the most highly decorated combat pilots in both wars.

Less known to the general public were his flying exploits in the polar regions. After the Korean War General McCarty took command of the 18th Air Force where he was instrumental in developing the techniques for landing C-124 Globemasters on sea ice and frozen lakes in the Arctic thereby making pos-

sible the rapid deployment of the Distant Early Warning Line across the Arctic from the Bering Straits to eastern Greenland.

After the development of the DEW Line General McCarty led the 18th Air Force from the Arctic to the Antarctic as part of Operation Deep Freeze to support the construction of South Pole Station. After construction crews were landed at the South Pole in 1956 General McCarty flew the first air drop of building materials needed to build the base. His unit followed—successfully parachuting all of the materials needed for establishment of the U.S. base at the Geographic South Pole. During this operation General McCarty became the first man in history to fly over both the North and South Poles in the same year.

He retired to Portland, Oregon in 1966 where he resumed his law career that had been interrupted by World War II and practiced law until 1995. In addition to his military decorations, General McCarty received numerous awards of excellence during his lengthy law career and has a classroom complex named for him at the Law School of Lewis and Clark College. He was interred with full military honors in Arlington National Cemetery. □

Ex-Geographical Society Head Lord Kirwan Dies

The Associated Press, 24 April 1999 LONDON (AP) — Sir Laurence Kirwan, who led the Royal Geographical Society for three decades and helped organize the first conquest of Mt. Everest, has died at age 91. Kirwan died April 16 in London after a brief illness, his family said. The cause of death was not announced.

As Director and Secretary of the Royal Geographical Society from 1945 to 1975, Kirwan was deeply involved in organizing three major expeditions: the Norwegian-British-Swedish Antarctic expedition of 1949-52 led by John Glaever; the 1953 Everest expedition led by John Hunt; and the Trans-Antarctic expedition of 1955-57 led by Vivian Fuchs.

Kirwan was knighted in 1972, and received the Knight Cross of the Order of St. Olav from Norway in 1975.

A family funeral was planned. □ (cb Billy-Ace Baker)

RADM James R. Reedy, former Commander Naval Support Force Antarctica

Sunshine Reedy died January 8, 1999 at Brooke Army Medical Center, San Antonio. He was 88. He hailed from Cleveland, Ohio and attended the Naval Academy where he captained the football team and also was a member of the lacrosse and boxing teams. Graduating in 1933, he entered naval flight training in 1934. His naval career spanned 39 years.

During WWII he commanded Fleet Air Wing 7 in England. Here as young Joseph Kennedy's commanding officer, he had the sad task of informing the family of Joe's death. Later he was Captain of the USS Lexington where he won the respect and admiration of his men by piloting his own A3D aboard ship. He also commanded Task Force 77 during the Viet Nam Conflict.

In 1964 as Commander of the naval Support Force Antarctica he pioneered new air routes between South Africa and Australia and Antarctica flying over thousands of miles of, heretofore, unexplored territory.

Reedy Glacier was named for him in Antarctica and in October 1998, Admiral Reedy was inducted as an Honorary Member of the American Polar Society at ceremonies in Columbus Ohio. □ (cb his daughter Molly Baker).

Letters to the Editor

To the Editor:

I enjoyed your article, "A Night Among the Icebergs," in the Spring-Summer issue of the *Polar Times*. It made me realize again that Capt. Apekhin is a Master Mariner in every sense of those words. I will never forget December 15, 1995, the day after we left Ushuaia, when we were hove to most of the day due to 80-knot winds off Cape Horn. Capt. Apekhin never left the bridge and was at all times in complete control. People who have sailed with him on the *Akademik Ioffe* can indeed count themselves fortunate to have sailed in a ship under his command.

Edgar Van Gelder
Westport, Ct.

To the Editor:

After 70 years of armchair polar exploring (sparked by Admiral Byrd's 28 Antarctic expeditions), the *Polar Times* continues to fire up my interest in the polar regions. So keep up the torch lit by August Howard. Well done by you, Ms. Weston, Peter Barretta, Peter Anderson, Billy-Ace Baker and all others involved.

Nathan J. Frank
Great Mills, Md.

Book Reviews

Innocents on the Ice: A Memoir of Antarctic Exploration, 1957

by John C. Behrendt.
Univ. Press of Colorado; 1998; 428 pages;

Review by Jim Collinson

The title is very appropriate for Behrendt's diary of events at Ellsworth Station on the Weddell Sea margin of the Filchner Ice Shelf and their long geophysical traverse as far south as the Dufek Massif during IGY (1956-1958).

The diary, that of a graduate student geophysicist and neophyte Antarctic, is made much more interesting by the running commentary from one of Antarctica's most accomplished, still active, scientists. The underlying plot describes a group of young scientists trying to cope with a system designed for the Navy and the harsh realities of exploring an unknown part of Antarctica. Many of the stories are amusing and almost unbelievable; they show the stress of wintering over and working in harsh conditions. I am amazed at how much was accomplished by Behrendt and his colleagues and other pioneers in the IGY program who worked with the relatively primitive equipment of the time. We need to hear more of their stories!

Particularly poignant to modern Antarctic scientists are Behrendt's comments in the Epilogue: "Sadly, the inductive approach to research planning appears to be viable no longer. Because of the large number of excellent scientists competing for limited resources in Antarctica and elsewhere, careful attention must be paid to the specific problem being investigated and its importance relative to other competing, and more or less equally significant, proposals. Perhaps there is no other way, but much of the excitement of heading into the unknown, which we experienced in the IGY, is missing today."

I highly recommend this book to everyone interested in Antarctica, but particularly to young scientists, many of whom have little idea of the great contributions by IGY scientists and support personnel who led the way. □



The Endurance: Shackleton's Legendary Antarctic Expedition

By Caroline Alexander; Alfred A. Knopf;
212 Pages; ISBN 0-375-40403-1

Review by Brian Shoemaker

Another book about Shackleton! The subject had been covered well by Alfred Lansing in 1959 and more recently in excruciating detail by Roland Huntford. What was left to tell? These were my first impressions when I received the book in the mail. It was tossed onto the coffee table to await an advertising break in the local news that evening.

Later, I thumbed through the book while Dan Rather droned on and, after five minutes, was hooked. The television was forgotten and the book was read cover to cover. What made this work different? Two things: Frank Hurley's photography and Caroline Alexander's style of writing and editing..

Frank Hurley captured the drama of the Endurance Expedition from beginning to end. He is often compared to Herbert Ponting who filmed Scott's last expedition. There is a major difference between the two, however. Ponting's photographs reveal him as a spectator while Hurley's bear witness to the fact that he was a participant in the expedition. His photographs dramatize the action as it took place, and the personalities of the men leap from the pages with authority.

As good as the photography is, it is the style of the tale told by Caroline Alexander and the artistic use of the photographs that make the book. She has cleaned up the photography, enhanced it and has skillfully placed each print within the text so that there is minimal page flipping needed for the reader to view who she is writing about. Her style is humanistic, succinct and dramatic drawing the reader into the expedition; one can feel

the chill of the winter, the movement of the ice and suffer the apprehension and drama of the ordeal. A *Must-Have* for any polar library. □

Under Polaris: An Arctic Quest

By Tahoe Talbot Washburn;
McLellan Publications; 247 Pages; ISBN 0-295-97761-2.

Review by Brian Shoemaker

Anyone who has had the good fortune to meet Lincoln (*Linc*) and Tahoe Washburn truly understands what it means when a couple are *inseparable*. The Washburns are the quintessence of inseparability, and this book is just one chapter of their love story.

Tahoe's book is the tale of the Washburns first trips to the Arctic between 1938 and 1941. Each year they flew to Coppermine in the Canadian Northwest Territories, their jumping-off point for "the field." They flew in the single engine Norseman with bush pilots who, at that time, were writing the rules of polar aviation.

From Coppermine they traveled any way they could—hitching rides on bush planes, small boats, and Eskimo dog sledges.

Always together, they traveled the coastal areas of Victoria and King William Islands, learning to deal with close calls aboard open boats while struggling to keep from colliding with ice floes, running aground in ice fog or drifting helplessly out into open water. They learned how to drive dogs and how to hunt and fish for food for themselves and their dogs.

Tahoe made a concerted effort to learn the survival skills of the Inuit women and to understand their lives. The process of making caribou skin clothing for herself and Linc is described with great clarity and humor.

She tells of their patience and gentle amusement as they helped her, their curiosity about her way of life, and their generosity in sharing their meager resources.

The book is enlivened with good maps and outstanding photographs that tell a story in themselves. However the story has no ending—it is only a beginning. It is a story of a young couple in love with each other and with the Arctic. The Washburns worked in the Arctic almost every year between 1938 and 1997. Let's hope that a sequel is in the works. □

Bibliography of Antarctic Exploration: Expedition Accounts from 1768 to 1960

By Larry Conrad; Thompson Shore, Inc.; 424 pages; ISBN 0-9669627-0-2.

Review by Brian Shoemaker

Larry Conrad, a former U.S. Navy pilot who flew in Antarctica with VXE-6, has done a monumental job of compiling a chronicle of expedition accounts to Antarctica from the days of Captain Cook through the period of the International Geophysical Year.

The work is an outstanding reference work of the literature available about each expedition to Antarctica. Conrad makes free use of Headland's *Chronological list of Antarctic Expeditions and Related Historical Events* and other reference and survey works to compile a reference work of his own. He begins each section with a brief narration about the expedition and then lists the literature concerning the expedition in alphabetical order by author.

A very useful work for researchers and others interested in Antarctic history. □

Announcements

Amundsen-Scott South Pole Station 1979-1980 Winter-Over Crew 20-Year Anniversary

Contact:

Mike Savage at mlsavage@the.net.nz
or
<http://members.tripod.com/~AntarcticNet>

22 Firth Terrace, Karori, New Zealand

committee to handle all this, as the squadron will be ill-equipped to do so from McMurdo.

For reunion plans or to volunteer for the memorabilia committee, please contact per the above.

American Polar Society 2000 Symposium

The American Polar Society has tentatively scheduled its next symposium for October 2000 at the University of Colorado, Boulder, Co.

Details will be included in our next issue of the *Polar Times*.

USS GLACIER (AGB-4) ASSOC.

Fourth Biennial Reunion

Date: September 21-27, 1999

Reunion Site:

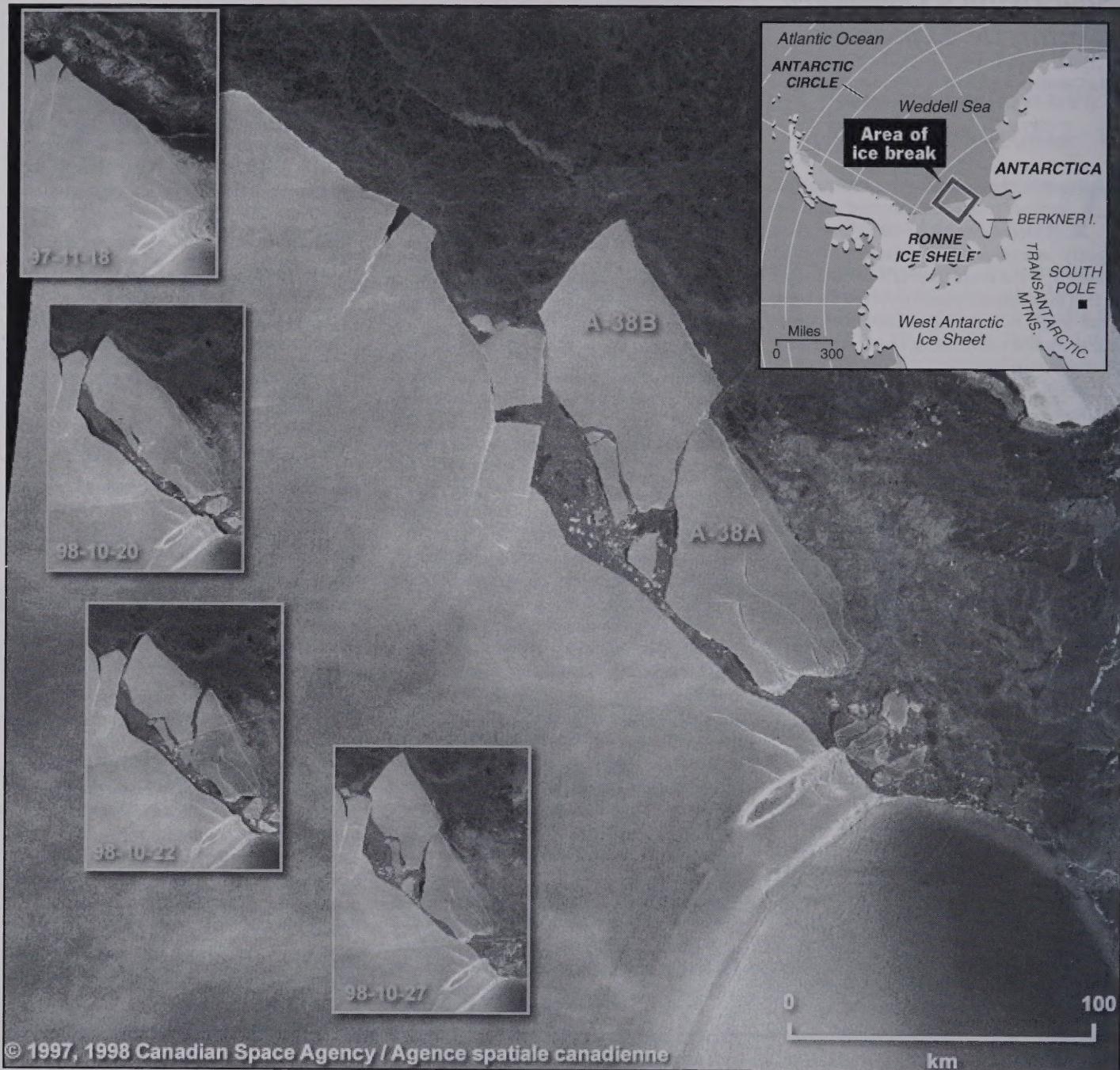
Radisson Hotel (Airport)
St. Louis, Missouri

Contact:

James A. Tinch, Pres., AGB4 Assn.
901 Chestnut Street
Livingston, TN 38570-1606
1-800-483-7938, PIN 81
or agb4@ussglacier.com

We are asking for alumni assistance in coordinating the display of memorabilia at the reunion. Careful attention to detail will be needed to properly obtain, display, and return these items. Volunteers are needed to form an alumni memorabilia

A 100-Mile-Long Iceberg Makes Its Break



© 1997, 1998 Canadian Space Agency / Agence spatiale canadienne

New York Times, 2 February 1999,
RADARSAT, Canadian Space Agency
and the Canada Center for Remote Sensing —Late last year, researchers at the United States National Ice Center captured striking images of an iceberg, 100 miles long and 30 miles wide, separating from the Ronne Ice Shelf in Antarctica. In 1987, a similarly sized iceberg broke free of the Ross Ice Shelf after 25 years of slow fracturing. Scientists do not know why these breakups happen but suspect climate changes and strong storm.

1. Nov. 18, 1997

The Ronne Ice Shelf before the separation. Here, ice from the Antarctic continent flows seaward at 1,000 yards a year. Note the fracturing on the ice on the right.

2. Oct. 20, 1998

The iceberg, larger than the state of Delaware, breaks away from the shelf.

3. Oct. 22, 1998

As it begins to drift, the iceberg, now named A-38, breaks into smaller icebergs, the two largest of which are designated A-38A and A-38B.

4. Oct. 27, 1998

The icebergs drift some 30 miles, smashing the icy peninsula on the left. Another vast piece begins to separate from the shelf.

5. Nov. 1, 1998

The icebergs continue to drift north. Though it may take years, they will ultimately move into warmer water and break into smaller icebergs. □ (*multiple contributors*)